

AD-A077 063

LAMONT-DOHERTY GEOLOGICAL OBSERVATORY PALISADES N Y

F/G 8/10

OBSERVATIONS OF POSITION, OCEAN DEPTH, ICE ROTATION, MAGNETIC D--ETC(U)

SEP 79 K HUNKINS , T MANLEY , W TIEMANN

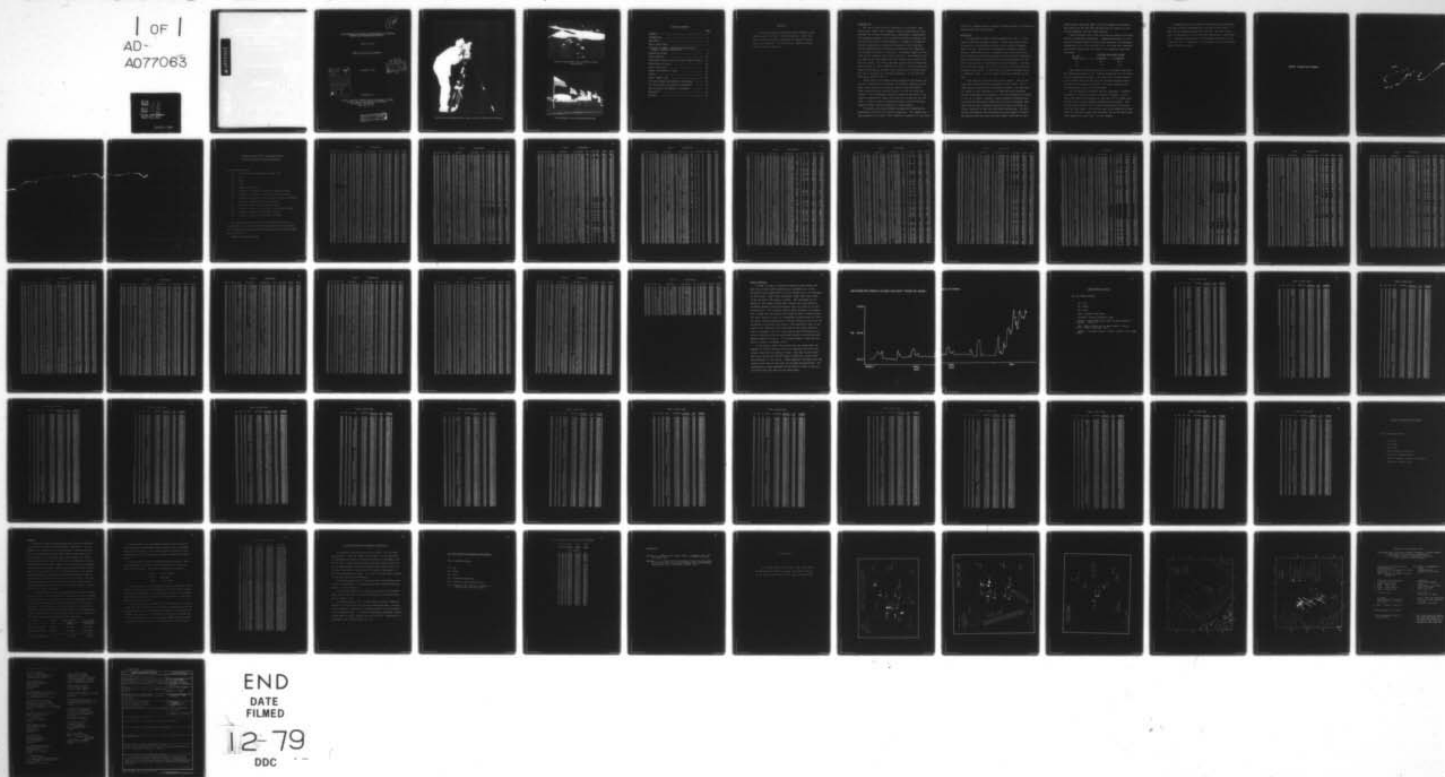
N00014-76-C-0004

UNCLASSIFIED

LD60-CU-1-79

NL

1 OF 1  
AD-  
A077063



END  
DATE  
FILMED

12-79

DDC

AD A 077063

12

Observations of Position, Ocean Depth, Ice Rotation,  
Magnetic Declination and Gravity

taken at the

FRAM I Drifting Ice Station

Accession For	
NTIS GRA&I	<input checked="checked" type="checkbox"/>
DDC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/ _____	
Availability Codes	
Dist.	Avail and/or special
<b>A</b>	

September 1979

DDC  
RECEIVED  
NOV 21 1979  
E

prepared by

Kenneth Hunkins, Thomas Manley and Werner Tiemann  
Lamont-Doherty Geological Observatory  
of Columbia University  
New York, N. Y.

This document has been approved  
for public release and sale; its  
distribution is unlimited.



SHOOTING THE SUN FOR CAMP AZIMUTH AT FRAM I: ALLAN GILL IS OPERATING THE THEODOLITE





HELICOPTER VIEW OF FRAM I AFTER THE CAMP ICE FLOE SPLIT  
ON MARCH 28, 1979



FLAGS ON FRAM I OF THE FOUR PARTICIPATING NATIONS

# TABLE OF CONTENTS

	Page
ABSTRACT .....	1
INTRODUCTION .....	2
NAVIGATION .....	3
FRAM I DRIFT TRACK .....	6
POSITIONS OF FRAM I DRIFTING STATION BASED ON TRANSIT SATELLITE NAVIGATION .....	7
NAVIGATION FIGURES .....	8
DEPTH SOUNDINGS .....	26
BATHYMETRIC PROFILE ALONG THE DRIFT TRACK OF FRAM I	27
OCEAN DEPTHS AT FRAM I .....	28
FRAM I DEPTH DATA .....	29
GRAVITY OBSERVATION AT FRAM I .....	45
GRAVITY .....	46
FRAM I GRAVITY DATA .....	48
ICE FLOE ROTATION AND MAGNETIC DECLINATION .....	49
ICE FLOE AZIMUTH AND MAGNETIC DECLINATION .....	50
FRAM I AZIMUTH AND MAGNETIC DECLINATION .....	51
REFERENCES .....	52
APPENDIX .....	53

(cont. fr p. 2)

ABSTRACT

This report contains geophysical data collected by the Lamont group at the FRAM I drifting station. These data include station positions determined by satellite navigation, echo soundings, ice floe azimuths, magnetic declination and gravity readings.

### Introduction

The Arctic Ocean north of Greenland is a relatively unexplored area. FRAM I was a research station established on drifting pack ice to carry out geological, geophysical, oceanographic and biological studies in this region with primary financial support from the Office of Naval Research. Aircraft for establishing and maintaining the station were based at Nord, Greenland through cooperation of the Danish government and the Commission for Scientific Research in Greenland. Additional support was provided by the Norwegian North Polar Institute. The scientific party consisted of participants from the United States, Norway, Denmark and Canada. The initial airplane landing at the station was made on March 11, 1979 at  $84^{\circ}24'N$  and  $6^{\circ}00'W$ . Within the next few weeks the scientific programs began operation and continued until the 13th of May when all programs terminated. On that date the camp was at  $83^{\circ}19'N$   $6^{\circ}52'W$ .

Investigators from Lamont-Doherty Geological Observatory carried out observations of position, ice rotation, magnetic declination, ocean depth and the earth's gravity field from FRAM I. These observations are reported here in the form of tables and figures. This information, especially position and depth, is essential background for nearly all scientific projects at the station. In order to make it available quickly, only the data are reported without detailed analysis or interpretation.

The Lamont group also conducted acoustic and oceanographic measurements which will be reported separately. The Lamont party participating in the FRAM I field expedition consisted of Jay Ardai,

Allan Gill, Kenneth Hunkins (Station Scientific Leader, 3/11-4/10/79), Thomas Manley and Charles Monjo.

#### Navigation

All positions of FRAM I were determined with the U. S. Navy Transit satellite navigation system. Transit satellites circle the earth in 107-minute polar orbits at an altitude of approximately 100 km. Each satellite continuously transmits position data as a function of time. By measuring the change in the Doppler frequency of the received signals as the satellite approaches, passes, and recedes, the position of the station relative to the satellites path can be determined with great precision. The number of satellite passes at a given site over a given time will be greatest at the poles. In the Arctic the interval between fixes is therefore short. Up to 40 useable fixes were received in one day.

Three satellite receivers were used at FRAM I. Most of the fixes were determined with two Magnavox MX 1502 units. One of these (serial number 30) was furnished by Lamont. The other (serial number 22) was furnished by the Norwegian Polar Institute. The MX 1502 system was introduced in 1977 and represents the state of the art in rugged, portable, nearly automatic navigation sets. The fixes and associated information are stored on magnetic tape. These data are also displayed visually and they were logged as often as possible in case the tape should malfunction. An older system, the Magnavox 706 (designated by serial number 706 here), was employed when the other sets were either being used in heli-



copter surveys away from FRAM I or out of operation for repairs. This system did not have tape recording and all fixes had to be recorded manually from the visual display.

Fixes calculated with the MX 1502 sets are based on the World Geodetic System-1972 coordinates. "Standard deviations" in latitude and longitude based on Doppler data residuals are calculated automatically by the 1502 for each fix. All fixes with "standard deviations" greater than the values in the following table were eliminated.

MX 1502 Serial No.	<u>"Standard deviation" cutoff</u>	
	Latitude	Longitude
22	64 m	88 m
30	56 m	73 m

These cutoff values were arrived at by calculating the mean and standard deviation of the "standard deviations" for all fixes of each instrument separately. All fixes with "standard deviations" greater than the mean plus one standard deviation were eliminated in two successive trials. The final cutoffs on the second pass are those in the above table.

The 706 satellite navigator does not calculate a "standard deviation" and the data required different treatment. First, fixes with satellite elevations of less than  $50^{\circ}$  or greater than  $70^{\circ}$  and with 6 or more computer iterations were dropped. Then the data were analyzed with a simple running mean of 20 points which was used twice. On the first pass, fixes departing by more than 2 km from the average were eliminated and on the second pass, those departing by more than 1 km were dropped.

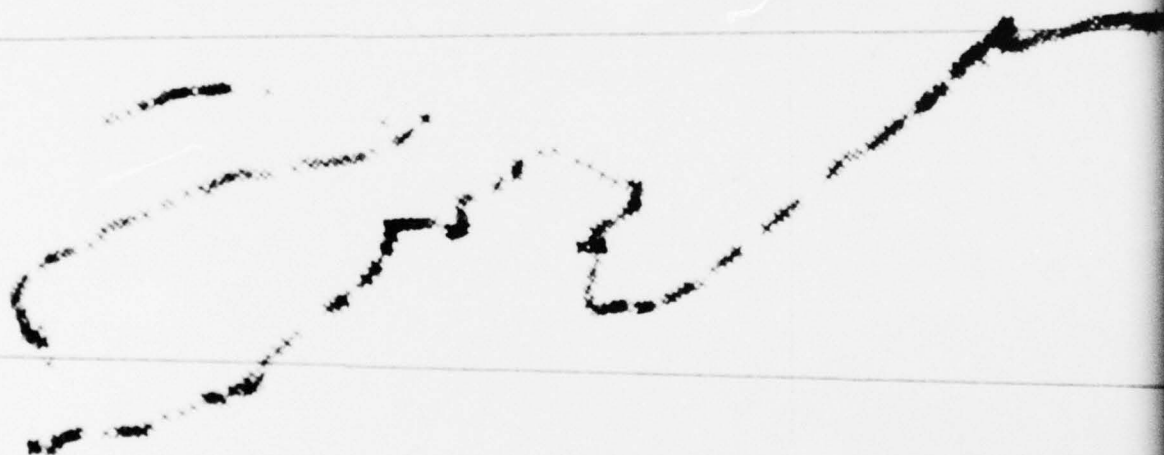
A comparison was made between fixes based on the same satellite pass received simultaneously on the two MX 1502 units. A total of 220 identical passes were recorded. The mean difference in latitude was 0.1 m and the mean difference in longitude, 57 m. Standard deviations of the differences were 183 m in latitude and 218 m in longitude. The antennae of the two sets were located about 25 m apart.



DRIFT TRACK OF FRAM I

85

1





84

2

1

6W

8W

10W

12W

83

3

1

Positions of the FRAM I Drifting Station  
based on TRANSIT Satellite Navigation

Key to column headings:

SN	Serial number of satellite receiver unit
DY	Day
MN	Month
YR	Year
GMT	Greenwich mean time
LAT	Latitude in degrees, minutes and decimal seconds
LONG	Longitude in degrees, minutes and decimal seconds
EL	Maximum elevation of satellite above horizon in degrees
I	Number of iterations in the computation
DP	Number of 23/28 - second Doppler counts
SAT	Last three digits of satellite identification number
SDY	Standard deviation of latitude in meters
SDX	Standard deviation of longitude in meters

Note that the last four columns of information are not available for the 706 fixes and the columns are filled with zeroes. Also, maximum elevation and iteration number were not always logged for the 706 fixes.

Negative longitude is west.



## FRAM 1

## NAVIGATION

SN	DT	MR	TR	GRT	LATITUDE		LONGITUDE		EL	I	DF	SAT	STDI	STDX		
30	18	3	79	2057	84	47	50.060	-8	30	43.382	56	3	26	140	37.0	24.0
30	18	3	79	2216	84	47	36.830	-8	29	26.320	66	2	25	190	51.0	42.0
30	19	3	79	2	84	47	12.330	-8	27	39.238	61	2	16	190	51.0	36.0
30	19	3	79	216	84	46	49.918	-8	25	12.124	66	2	21	140	54.0	54.0
30	19	3	79	229	84	46	42.502	-8	25	42.529	60	3	21	200	41.0	33.0
30	19	3	79	334	84	46	35.306	-8	24	52.644	68	2	31	190	46.0	38.0
30	19	3	79	892	84	46	16.794	-8	23	40.326	63	2	24	120	43.0	32.0
30	19	3	79	856	84	46	12.455	-8	23	21.696	71	3	26	190	39.0	57.0
30	19	3	79	924	84	46	8.115	-8	22	39.119	63	2	27	140	39.0	19.0
30	19	3	79	1043	84	45	57.953	-8	22	1.868	62	3	29	190	48.0	32.0
30	19	3	79	1134	84	45	51.361	-8	21	15.642	60	3	20	120	56.0	26.0
30	19	3	79	1146	84	45	47.296	-8	21	27.136	60	3	23	130	53.0	29.0
30	19	3	79	1231	84	45	36.837	-8	21	5.323	59	3	29	190	38.0	19.0
30	19	3	79	1256	84	45	32.959	-8	20	48.315	67	3	25	140	48.0	35.0
30	19	3	79	1336	84	45	26.839	-8	20	25.882	60	3	25	130	46.0	23.0
30	19	3	79	1418	84	45	23.291	-8	20	14.532	62	3	31	190	38.0	21.0
30	19	3	79	1524	84	45	16.864	-8	19	47.286	66	3	24	130	39.0	30.0
30	19	3	79	1606	84	45	10.657	-8	20	2.110	70	3	35	190	30.0	35.0
30	19	3	79	1711	84	45	5.988	-8	20	7.439	74	3	36	130	27.0	60.0
30	19	3	79	2045	84	44	47.531	-8	19	33.554	69	3	33	130	33.0	50.0
30	19	3	79	2127	84	44	40.939	-8	19	23.864	69	3	32	190	50.0	55.0
30	19	3	79	2232	84	44	34.162	-8	19	17.513	59	3	24	130	41.0	29.0
30	19	3	79	2313	84	44	27.206	-8	19	19.552	62	3	28	190	40.0	18.0
30	19	3	79	2335	84	44	25.942	-8	20	27.686	75	3	23	200	36.0	71.0
30	20	3	79	0	84	44	17.426	-8	19	34.521	58	3	23	120	47.0	39.0
30	20	3	79	16	84	44	17.263	-8	18	58.266	55	3	24	130	47.0	19.0
30	20	3	79	100	84	44	9.353	-8	18	34.110	61	3	30	190	53.0	27.0
30	20	3	79	121	84	44	4.519	-8	18	35.502	64	3	16	200	41.0	33.0
30	20	3	79	146	84	43	57.433	-8	19	35.874	67	3	26	120	53.0	53.0
30	20	3	79	204	84	43	56.654	-8	18	31.810	57	3	17	130	46.0	47.0
30	20	3	79	246	84	43	50.457	-8	18	43.757	65	3	25	190	54.0	48.0
30	20	3	79	306	84	43	47.965	-8	18	59.639	58	3	18	200	44.0	31.0
30	20	3	79	1354	84	42	27.235	-8	20	13.103	73	3	24	140	49.0	56.0
30	22	3	79	1106	84	36	33.331	-8	31	14.384	60	4	31	130	35.0	18.0
30	23	3	79	1018	84	37	10.439	-8	29	51.898	63	7	15	130	44.0	52.0
30	23	3	79	1102	84	37	5.865	-8	29	51.259	60	3	27	190	35.0	23.0
30	23	3	79	1250	84	37	0.866	-8	29	10.486	59	2	29	190	41.0	22.0
30	23	3	79	2332	84	37	33.076	-8	33	55.375	60	2	37	190	48.0	21.0
30	24	3	79	23	84	37	40.437	-8	35	13.248	67	2	32	200	28.0	32.0
30	24	3	79	118	84	37	40.479	-8	36	1.107	61	3	37	190	40.0	19.0
30	24	3	79	209	84	37	57.141	-8	37	5.981	59	3	29	200	32.0	25.0
30	24	3	79	304	84	37	54.388	-8	36	10.244	67	3	32	190	36.0	33.0
30	24	3	79	356	84	38	11.803	-8	38	8.040	57	3	31	200	29.0	16.0
30	24	3	79	825	84	38	54.545	-8	41	40.111	72	3	33	190	32.0	49.0
30	24	3	79	929	84	39	11.678	-8	43	28.422	67	2	26	130	38.0	53.0
30	24	3	79	1012	84	39	21.456	-8	43	47.463	62	3	27	190	37.0	29.0
30	24	3	79	1030	84	39	20.290	-8	44	17.160	57	3	20	120	37.0	22.0
30	24	3	79	1116	84	39	11.012	-8	45	3.371	60	3	21	130	37.0	22.0
30	24	3	79	1200	84	39	50.570	-8	44	55.070	59	3	37	190	35.0	18.0
30	24	3	79	1244	84	40	1.342	-8	46	16.959	66	3	28	200	40.0	41.0
30	24	3	79	1304	84	40	7.489	-8	45	42.551	59	3	30	130	30.0	18.0
30	24	3	79	1348	84	40	19.349	-8	45	53.043	61	3	36	190	34.0	22.0
30	24	3	79	1430	84	40	30.346	-8	46	58.434	59	3	35	200	42.0	21.0
30	24	3	79	1452	84	40	10.723	-8	46	9.475	65	3	26	130	38.0	33.0
30	24	3	79	1536	84	40	54.346	-8	46	5.739	69	3	27	190	46.0	73.0
30	24	3	79	1614	84	40	54.619	-8	47	34.372	59	3	27	200	40.0	23.0
30	24	3	79	1639	84	41	14.561	-8	45	48.656	77	3	27	130	36.0	62.0
30	24	3	79	1759	84	41	34.006	-8	48	41.581	64	4	32	200	40.0	32.0
30	24	3	79	2013	84	42	26.027	-8	50	41.984	71	3	25	130	52.0	72.0
30	24	3	79	2057	84	42	42.341	-8	50	51.020	70	3	33	190	45.0	52.0
30	24	3	79	2200	84	43	3.051	-8	50	51.755	60	3	25	130	44.0	27.0
30	24	3	79	2243	84	43	12.828	-8	51	4.437	62	3	30	190	40.0	24.0
30	24	3	79	2316	84	43	19.469	-8	49	46.469	75	2	28	200	27.0	56.0
30	24	3	79	2346	84	43	32.549	-8	51	13.254	55	3	23	130	44.0	31.0
30	25	3	79	29	84	43	41.342	-8	51	49.193	60	3	27	190	30.0	14.0
30	25	3	79	43	84	43	51.061	-8	51	31.738	63	2	16	120	34.0	27.0
30	25	3	79	102	84	43	52.379	-8	51	50.971	64	3	34	200	27.0	23.0
30	25	3	79	132	84	43	57.653	-8	52	49.563	56	3	28	130	43.0	21.0

## FRAM 1

## NAVIGATION

SN	DI	MM	YY	GMT	LATITUDE			LONGITUDE			EL	I	DP	SAT	STDY	STDX
30	25	3	79	210	84	44	5.508	-8	54	5.808	64	3	29	190	48.0	27.0
30	25	3	79	248	84	44	20.559	-8	53	42.475	58	3	33	200	32.0	19.0
30	25	3	79	319	84	44	21.932	-8	55	10.936	63	3	33	130	34.0	33.0
30	25	3	79	402	84	44	29.403	-8	57	21.481	73	3	31	190	47.0	66.0
30	25	3	79	434	84	44	47.091	-8	55	52.952	58	3	30	200	33.0	18.0
30	25	3	79	620	84	45	13.678	-8	57	50.631	65	3	28	200	36.0	34.0
30	25	3	79	840	84	45	45.868	-9	1	38.410	72	3	25	130	41.0	55.0
30	25	3	79	923	84	45	59.601	-9	2	31.261	66	3	28	190	38.0	47.0
30	25	3	79	1111	84	46	37.394	-9	6	4.629	60	3	25	190	55.0	32.0
30	25	3	79	1215	84	47	0.959	-9	7	29.780	59	3	28	130	35.0	18.0
30	25	3	79	1259	84	47	16.176	-9	8	17.303	60	3	33	190	34.0	18.0
30	25	3	79	1323	84	47	20.295	-9	8	7.147	63	3	35	200	42.0	30.0
30	25	3	79	1402	84	47	34.193	-9	9	41.067	62	3	25	130	35.0	30.0
30	25	3	79	1446	84	47	46.882	-9	10	16.942	65	3	23	190	53.0	45.0
30	25	3	79	1550	84	48	0.725	-9	11	39.046	72	3	30	130	30.0	40.0
30	25	3	79	1652	84	48	4.241	-9	14	36.881	61	3	26	200	48.0	25.0
30	25	3	79	1838	84	48	26.708	-9	17	25.246	68	3	25	200	43.0	49.0
30	25	3	79	2111	84	49	3.347	-9	19	41.964	65	3	29	130	35.0	40.0
30	25	3	79	2154	84	49	13.070	-9	20	1.197	65	3	32	190	46.0	36.0
30	25	3	79	2257	84	49	23.562	-9	20	57.790	57	3	21	130	44.0	29.0
30	25	3	79	2354	84	49	38.394	-9	21	55.565	70	3	21	200	34.0	5.0
30	26	3	79	44	84	49	43.557	-9	22	23.731	56	3	19	130	44.0	25.0
30	26	3	79	127	84	49	47.842	-9	23	6.097	62	3	26	190	41.0	20.0
30	26	3	79	140	84	49	56.631	-9	23	15.133	61	3	24	200	38.0	32.0
30	26	3	79	314	84	50	4.371	-9	25	35.985	69	3	32	190	51.0	48.0
30	26	3	79	750	84	50	37.610	-9	29	49.007	78	3	31	130	29.0	59.0
30	26	3	79	834	84	50	40.686	-9	31	6.440	71	3	30	190	31.0	46.0
30	26	3	79	936	84	50	44.586	-9	32	41.492	67	3	34	130	30.0	28.0
30	26	3	79	1022	84	50	47.552	-9	33	26.948	62	3	26	190	43.0	44.0
30	26	3	79	1125	84	50	52.386	-9	34	57.716	60	2	34	130	31.0	17.0
30	26	3	79	1210	84	50	52.441	-9	35	23.616	59	2	22	190	51.0	49.0
30	26	3	79	1313	84	50	55.463	-9	36	31.024	60	2	33	130	37.0	18.0
30	26	3	79	1358	84	50	57.330	-9	37	32.911	62	2	23	190	46.0	34.0
30	26	3	79	1500	84	50	57.550	-9	38	35.273	67	2	35	130	30.0	27.0
30	26	3	79	1648	84	50	58.374	-9	40	4.729	79	3	31	130	34.0	69.0
30	26	3	79	2022	84	50	51.178	-9	42	46.990	69	2	31	130	29.0	43.0
706	26	3	79	2202	84	50	45.900	-9	43	22.200	0	0	0	0	0.0	0.0
30	26	3	79	2208	84	50	46.619	-9	43	25.174	60	2	31	130	37.0	27.0
30	26	3	79	2355	84	50	43.552	-9	43	56.801	56	2	25	130	40.0	20.0
30	27	3	79	327	84	50	41.620	-9	44	35.487	65	3	23	130	44.0	44.0
706	27	3	79	506	84	50	41.400	-9	44	11.760	0	0	0	0	0.0	0.0
706	27	3	79	1102	84	50	37.020	-9	46	21.480	0	0	0	0	0.0	0.0
706	27	3	79	1306	84	50	42.000	-9	46	52.440	0	0	0	0	0.0	0.0
706	27	3	79	1452	84	50	35.220	-9	48	49.260	0	0	0	0	0.0	0.0
706	27	3	79	1636	84	50	33.720	-9	49	28.980	0	0	0	0	0.0	0.0
706	27	3	79	1820	84	50	32.100	-9	50	19.800	0	0	0	0	0.0	0.0
30	27	3	79	1822	84	50	35.632	-9	51	22.633	37	3	19	120	52.0	45.0
706	27	3	79	2006	84	50	5.100	-9	48	37.020	0	0	0	0	0.0	0.0
30	27	3	79	2009	84	50	29.205	-9	51	36.098	58	2	33	120	29.0	20.0
30	27	3	79	2120	84	50	25.360	-9	52	4.731	63	3	28	130	40.0	35.0
30	27	3	79	2156	84	50	24.426	-9	51	44.764	55	2	27	120	34.0	16.0
30	27	3	79	2306	84	50	21.460	-9	52	18.478	56	2	25	130	33.0	17.0
30	27	3	79	2343	84	50	19.373	-9	52	18.176	59	2	29	120	30.0	24.0
30	28	3	79	52	84	50	18.164	-9	52	33.474	56	3	17	130	51.0	24.0
30	28	3	79	130	84	50	17.340	-9	52	43.307	69	2	28	120	33.0	40.0
30	28	3	79	238	84	50	15.582	-9	53	17.598	61	2	24	130	44.0	42.0
30	28	3	79	425	84	50	12.781	-9	53	5.081	72	3	29	130	31.0	65.0
30	28	3	79	444	84	50	9.375	-9	53	53.338	59	3	30	200	43.0	24.0
706	28	3	79	644	84	50	3.120	-9	54	12.120	0	0	0	0	0.0	0.0
30	28	3	79	649	84	50	1.190	-9	54	5.423	67	2	33	120	32.0	32.0
706	28	3	79	752	84	49	59.700	-9	55	3.480	0	0	0	0	0.0	0.0
30	28	3	79	759	84	49	59.872	-9	54	59.812	77	3	29	130	33.0	62.0
706	28	3	79	812	84	49	55.680	-9	54	8.640	0	0	0	0	0.0	0.0
30	28	3	79	1913	84	49	46.414	-10	2	27.869	62	3	29	120	34.0	30.0
30	29	3	79	1112	84	50	9.265	-10	32	44.857	60	3	19	120	45.0	32.0
30	29	3	79	1130	84	50	14.703	-10	33	6.575	60	2	32	190	53.0	29.0
706	29	3	79	1216	84	50	10.500	-10	34	10.440	0	0	0	0	0.0	0.0
30	29	3	79	1225	84	50	11.298	-10	34	28.575	67	3	33	200	44.0	43.0



## FRAM 1

## NAVIGATION

SN	DT	MN	IK	GMI	LATITUDE		LONGITUDE		EL	I	DP	SAT	STDY	STDZ
30	29	3	79	1258	84	50	13.110	-10	33	58.953	68	2 20 120	35.0	36.0
30	29	3	79	1410	84	50	13.440	-10	34	51.577	80	3 25 200	48.0	27.0
706	29	3	79	1732	84	50	12.780	-10	34	1.980	0	0 0 0	0.0	0.0
706	29	3	79	1832	84	50	8.880	-10	33	6.540	0	0 0 0	0.0	0.0
30	29	3	79	1835	84	50	13.165	-10	34	42.513	64	3 22 140	49.0	62.0
30	29	3	79	2021	84	50	12.177	-10	34	20.609	56	3 31 140	45.0	25.0
30	29	3	79	2126	84	50	10.693	-10	34	13.139	62	3 26 130	50.0	34.0
30	29	3	79	2256	84	50	11.957	-10	34	53.266	76	3 27 200	33.0	67.0
30	29	3	79	2314	84	50	11.737	-10	34	9.754	56	2 31 130	38.0	21.0
30	29	3	79	2353	84	50	10.913	-10	34	29.591	57	2 33 140	35.0	25.0
30	30	3	79	42	84	50	11.462	-10	34	51.605	65	2 34 200	28.0	25.0
30	30	3	79	101	84	50	11.023	-10	34	27.943	56	3 32 130	32.0	16.0
30	30	3	79	415	84	50	1.740	-10	34	27.579	58	2 34 200	42.0	23.0
30	30	3	79	606	84	49	40.261	-10	35	18.521	75	3 31 130	32.0	53.0
30	30	3	79	647	84	49	37.515	-10	34	52.319	63	3 29 140	45.0	31.0
30	30	3	79	955	84	49	33.175	-10	34	16.057	64	2 20 130	49.0	55.0
30	30	3	79	1143	84	49	26.748	-10	33	1.590	60	3 32 130	35.0	21.0
30	30	3	79	1222	84	49	26.034	-10	32	43.566	68	3 27 140	45.0	31.0
30	30	3	79	1303	84	49	27.572	-10	31	57.691	64	2 28 200	48.0	37.0
30	30	3	79	1330	84	49	22.518	-10	31	45.867	62	2 29 130	34.0	21.0
30	30	3	79	1446	84	49	23.562	-10	30	54.101	59	3 34 200	40.0	18.0
30	30	3	79	1516	84	49	20.815	-10	30	50.249	70	2 30 130	38.0	42.0
30	30	3	79	1633	84	49	22.189	-10	30	23.250	60	2 33 200	40.0	22.0
30	30	3	79	2116	84	49	7.632	-10	30	14.255	54	3 28 140	42.0	22.0
30	30	3	79	2226	84	49	1.315	-10	29	43.871	58	3 28 130	38.0	27.0
30	30	3	79	2302	84	48	59.557	-10	29	36.091	55	2 28 140	43.0	24.0
30	30	3	79	2334	84	48	57.744	-10	29	32.623	71	3 32 200	36.0	53.0
30	31	3	79	12	84	48	53.350	-10	29	10.603	55	2 29 130	49.0	21.0
30	31	3	79	46	84	48	51.152	-10	28	34.128	62	3 26 140	39.0	39.0
30	31	3	79	121	84	48	46.923	-10	28	34.389	61	3 33 200	37.0	26.0
30	31	3	79	156	84	48	43.846	-10	28	22.524	59	3 33 130	34.0	22.0
30	31	3	79	344	84	48	36.376	-10	27	0.332	68	3 16 130	40.0	64.0
30	31	3	79	906	84	47	45.729	-10	27	47.347	68	3 24 130	32.0	36.0
706	31	3	79	1050	84	47	17.520	-10	27	5.160	61	3 0 0	0.0	0.0
706	31	3	79	1050	84	47	17.520	-10	27	5.160	61	3 0 0	0.0	0.0
706	31	3	79	1050	84	47	17.520	-10	27	5.160	61	3 0 0	0.0	0.0
706	31	3	79	1050	84	47	17.520	-10	27	5.160	61	3 0 0	0.0	0.0
30	31	3	79	1053	84	47	18.373	-10	27	13.056	61	3 27 130	42.0	27.0
30	31	3	79	1106	84	47	15.846	-10	27	5.132	60	3 25 120	41.0	27.0
706	31	3	79	1122	84	47	5.520	-10	27	17.460	0	0 0 0	0.0	0.0
30	31	3	79	1130	84	47	4.530	-10	27	6.752	65	3 34 140	46.0	29.0
706	31	3	79	1146	84	46	53.340	-10	26	41.400	0	0 0 0	0.0	0.0
706	31	3	79	1146	84	46	53.340	-10	26	41.400	0	0 0 0	0.0	0.0
30	31	3	79	1156	84	46	54.917	-10	26	56.755	69	3 27 200	54.0	62.0
30	31	3	79	1241	84	46	45.469	-10	26	34.034	60	3 27 130	29.0	15.0
706	31	3	79	1310	84	46	33.540	-10	26	49.800	0	0 0 0	0.0	0.0
30	31	3	79	1316	84	46	32.230	-10	27	6.533	74	3 29 140	42.0	53.0
706	31	3	79	1336	84	46	31.140	-10	26	22.680	61	3 0 0	0.0	0.0
30	31	3	79	1341	84	46	31.626	-10	26	26.673	61	3 32 200	47.0	28.0
706	31	3	79	1422	84	46	18.480	-10	24	43.080	0	0 0 0	0.0	0.0
30	31	3	79	1429	84	46	17.014	-10	24	56.187	65	3 26 130	35.0	30.0
706	31	3	79	1644	84	45	45.900	-10	20	57.060	0	0 0 0	0.0	0.0
706	31	3	79	1844	84	45	11.640	-10	19	26.620	0	0 0 0	0.0	0.0
706	31	3	79	2202	84	44	46.720	-10	17	5.760	0	0 0 0	0.0	0.0
706	1	4	79	102	84	44	19.230	-10	13	23.580	56	3 0 0	0.0	0.0
706	1	4	79	134	84	44	11.040	-10	12	45.000	68	3 0 0	0.0	0.0
30	1	4	79	816	84	43	29.143	-10	10	22.870	72	2 30 130	29.0	45.0
30	1	4	79	902	84	43	24.694	-10	10	26.488	66	3 17 190	53.0	51.0
706	1	4	79	1224	84	42	52.740	-10	9	39.960	0	0 0 0	0.0	0.0
30	1	4	79	1339	84	42	57.502	-10	7	54.417	62	2 22 130	54.0	33.0
706	1	4	79	1740	84	42	37.500	-10	5	45.120	68	3 0 0	0.0	0.0
706	1	4	79	1944	84	42	28.560	-10	4	35.760	0	0 0 0	0.0	0.0
706	2	4	79	812	84	42	37.320	-10	7	37.500	70	4 0 0	0.0	0.0
706	2	4	79	906	84	42	42.960	-10	8	32.700	0	0 0 0	0.0	0.0
706	2	4	79	954	84	42	48.840	-10	9	17.880	61	3 0 0	0.0	0.0
706	2	4	79	1120	84	43	0.900	-10	10	3.300	0	0 0 0	0.0	0.0
706	2	4	79	1140	84	43	0.540	-10	10	7.560	58	3 0 0	0.0	0.0
706	2	4	79	1304	84	43	10.440	-10	10	7.200	61	3 0 0	0.0	0.0

## FRAM 1

## NAVIGATION

SN	DI	MM	YY	GAL	LATITUDE		LONGITUDE		EL	I	DP	SAT	STDY	STDX
706	2	4	79	1304	84	43	10.440	-10	10	7.200	61	3	0	0.0
706	2	4	79	1304	84	43	10.440	-10	10	7.200	61	3	0	0.0
706	2	4	79	1320	84	43	24.240	-10	10	51.000	70	2	0	0.0
706	2	4	79	1802	84	43	47.160	-10	14	42.540	0	0	0	0.0
706	2	4	79	2336	84	44	20.820	-10	14	15.780	59	3	0	0.0
706	3	4	79	112	84	44	27.000	-10	13	27.240	0	0	0	0.0
706	3	4	79	1146	84	44	12.000	-10	14	21.180	0	0	0	0.0
706	3	4	79	1346	84	44	3.420	-10	13	14.760	59	3	0	0.0
706	3	4	79	1408	84	43	56.820	-10	14	14.340	0	0	0	0.0
706	3	4	79	1426	84	43	55.140	-10	12	43.560	66	3	0	0.0
706	3	4	79	1706	84	43	34.980	-10	10	42.000	0	0	0	0.0
706	3	4	79	1852	84	43	17.220	-10	8	21.060	60	3	0	0.0
706	3	4	79	2040	84	43	2.940	-10	6	18.660	0	0	0	0.0
706	3	4	79	2208	84	42	59.880	-10	10	59.940	0	0	0	0.0
706	3	4	79	2226	84	42	51.540	-10	4	19.140	56	3	0	0.0
706	4	4	79	106	84	42	31.740	-10	0	21.120	62	3	0	0.0
706	4	4	79	202	84	42	23.340	-9	59	45.660	57	3	0	0.0
706	4	4	79	232	84	42	20.640	-9	57	35.220	0	0	0	0.0
706	4	4	79	534	84	42	2.220	-9	55	46.560	0	0	0	0.0
706	4	4	79	606	84	41	58.980	-9	54	57.000	0	0	0	0.0
706	4	4	79	754	84	41	43.260	-9	52	36.000	0	0	0	0.0
706	4	4	79	814	84	41	40.920	-9	52	21.480	68	2	0	0.0
706	4	4	79	1050	84	41	21.600	-9	49	2.520	0	0	0	0.0
706	4	4	79	1814	84	40	20.040	-9	39	56.700	0	0	0	0.0
706	4	4	79	1836	84	40	17.580	-9	39	25.140	60	3	0	0.0
706	4	4	79	2004	84	40	7.800	-9	38	25.860	0	0	0	0.0
706	4	4	79	2022	84	40	7.320	-9	38	4.680	54	3	0	0.0
706	4	4	79	2122	84	39	58.380	-9	39	52.860	0	0	0	0.0
706	4	4	79	2152	84	39	58.920	-9	37	24.000	0	0	0	0.0
706	4	4	79	2208	84	39	58.980	-9	37	1.620	54	3	0	0.0
706	4	4	79	2306	84	39	49.560	-9	37	0.600	69	3	0	0.0
706	4	4	79	2354	84	39	52.980	-9	36	11.400	0	0	0	0.0
706	5	4	79	54	84	39	49.680	-9	37	13.500	60	4	0	0.0
706	5	4	79	54	84	39	49.680	-9	37	13.500	60	4	0	0.0
706	5	4	79	124	84	39	48.660	-9	36	21.240	0	0	0	0.0
706	5	4	79	242	84	39	47.400	-9	35	38.400	56	2	0	0.0
706	5	4	79	612	84	39	39.120	-9	33	34.140	67	3	0	0.0
706	5	4	79	1036	84	39	20.160	-9	30	35.100	63	3	0	0.0
706	5	4	79	1354	84	39	5.880	-9	28	19.620	0	0	0	0.0
706	5	4	79	1412	84	39	2.640	-9	28	53.760	0	0	0	0.0
706	5	4	79	1436	84	39	1.560	-9	28	15.900	67	4	0	0.0
706	5	4	79	1458	84	39	2.400	-9	28	2.100	0	0	0	0.0
706	5	4	79	1518	84	39	1.680	-9	29	3.720	0	0	0	0.0
706	5	4	79	1536	84	38	57.960	-9	27	28.200	0	0	0	0.0
706	5	4	79	1750	84	38	48.240	-9	26	5.220	0	0	0	0.0
706	5	4	79	1832	84	38	54.000	-9	25	8.520	0	0	0	0.0
706	5	4	79	1932	84	38	46.680	-9	25	18.300	0	0	0	0.0
706	5	4	79	1956	84	38	44.640	-9	24	45.120	0	0	0	0.0
706	5	4	79	2118	84	38	44.580	-9	23	43.560	0	0	0	0.0
706	5	4	79	2142	84	38	41.280	-9	23	35.880	0	0	0	0.0
706	5	4	79	2224	84	38	41.220	-9	22	59.100	0	0	0	0.0
706	5	4	79	2304	84	38	41.700	-9	22	33.480	0	0	0	0.0
706	6	4	79	156	84	38	35.760	-9	21	11.460	0	0	0	0.0
706	6	4	79	744	84	38	17.400	-9	16	25.800	0	0	0	0.0
706	6	4	79	809	84	38	25.440	-9	18	29.520	0	0	0	0.0
706	6	4	79	900	84	38	25.800	-9	18	20.940	0	0	0	0.0
706	6	4	79	944	84	38	24.000	-9	18	10.980	0	0	0	0.0
706	6	4	79	1118	84	38	23.340	-9	17	15.540	0	0	0	0.0
706	6	4	79	1134	84	38	24.060	-9	17	0.540	67	3	0	0.0
706	6	4	79	1158	84	38	21.960	-9	17	8.220	0	0	0	0.0
706	6	4	79	1232	84	38	23.940	-9	16	25.920	0	0	0	0.0
706	6	4	79	1300	84	38	22.320	-9	16	41.760	0	0	0	0.0
706	6	4	79	1418	84	38	21.420	-9	14	40.560	0	0	0	0.0
706	6	4	79	1448	84	38	18.840	-9	15	54.660	70	4	0	0.0
706	6	4	79	2202	84	38	7.620	-9	13	6.900	0	0	0	0.0
706	6	4	79	2216	84	38	13.140	-9	13	9.960	0	0	0	0.0
706	6	4	79	2314	84	38	10.920	-9	11	58.260	60	3	0	0.0
706	7	4	79	210	84	38	12.720	-9	11	36.900	0	0	0	0.0

## FRAM 1

## NAVIGATION

SR	DI	MM	IR	GSI	LATITUDE		LONGITUDE		EL	I	DP	SAT	STDY	STDX		
706	1	4	79	020	84	38	11.520	-9	12	24.720	64	5	0	0.0	0.0	
706	1	4	79	048	84	38	15.780	-9	11	7.260	0	0	0	0.0	0.0	
706	1	4	79	708	84	38	15.720	-9	10	26.700	0	0	0	0.0	0.0	
706	1	4	79	834	84	38	16.920	-9	10	28.800	0	0	0	0.0	0.0	
706	1	4	79	854	84	38	17.280	-9	10	33.600	61	4	0	0.0	0.0	
706	1	4	79	1042	84	38	18.720	-9	9	57.060	64	3	0	0.0	0.0	
30	1	4	79	1048	84	38	20.922	-9	9	51.270	64	3	31	140	40.0	21.0
706	1	4	79	1216	84	38	17.880	-9	9	39.240	0	0	0	0.0	0.0	
706	1	4	79	1232	84	38	17.760	-9	9	40.200	0	0	0	0.0	0.0	
706	1	4	79	1250	84	38	16.200	-9	10	54.840	0	0	0	0.0	0.0	
30	7	4	79	1406	84	38	20.702	-9	9	20.598	66	2	26	130	39.0	27.0
30	1	4	79	1704	84	38	20.757	-9	8	34.277	70	3	21	120	33.0	60.0
706	1	4	79	1820	84	38	16.440	-9	9	17.760	0	0	0	0.0	0.0	
30	1	4	79	1851	84	38	19.164	-9	8	14.577	59	2	27	120	31.0	23.0
30	1	4	79	2038	84	38	18.560	-9	8	37.813	55	3	23	120	35.0	28.0
706	1	4	79	2126	84	38	14.940	-9	8	54.120	0	0	0	0.0	0.0	
706	1	4	79	2152	84	38	16.320	-9	8	55.980	0	0	0	0.0	0.0	
30	7	4	79	2200	84	38	17.076	-9	9	1.550	60	2	34	190	55.0	32.0
30	7	4	79	2226	84	38	17.461	-9	8	16.321	57	2	30	120	24.0	16.0
706	8	4	79	38	84	38	17.400	-9	8	13.860	0	0	0	0.0	0.0	
706	8	4	79	58	84	38	15.960	-9	8	56.640	66	5	0	0.0	0.0	
706	8	4	79	124	84	38	14.160	-9	8	35.160	63	3	0	0.0	0.0	
706	8	4	79	618	84	38	13.080	-9	8	24.660	0	0	0	0.0	0.0	
706	8	4	79	644	84	38	12.240	-9	8	57.240	0	0	0	0.0	0.0	
706	8	4	79	710	84	38	10.320	-9	9	6.300	60	2	0	0.0	0.0	
706	8	4	79	838	84	38	11.880	-9	8	36.660	64	3	0	0.0	0.0	
30	8	4	79	904	84	38	13.011	-9	9	3.185	57	2	26	120	37.0	19.0
30	8	4	79	1028	84	38	12.462	-9	8	32.650	58	2	28	190	52.0	30.0
706	8	4	79	1042	84	38	12.000	-9	8	7.920	61	3	0	0.0	0.0	
30	8	4	79	1128	84	38	12.902	-9	8	42.318	59	3	26	130	36.0	19.0
706	8	4	79	1140	84	38	9.300	-9	8	36.780	68	3	0	0.0	0.0	
706	8	4	79	1208	84	38	10.500	-9	8	44.520	0	0	0	0.0	0.0	
706	8	4	79	1322	84	38	9.480	-9	8	16.140	0	0	0	0.0	0.0	
706	8	4	79	1356	84	38	8.160	-9	8	33.240	64	3	0	0.0	0.0	
22	8	4	79	1504	84	38	7.079	-9	8	31.496	72	2	24	130	32.0	48.0
30	8	4	79	1608	84	38	7.024	-9	8	59.779	77	3	27	120	24.0	69.0
706	8	4	79	1750	84	38	3.060	-9	8	47.100	64	3	0	0.0	0.0	
22	8	4	79	1755	84	38	5.321	-9	8	34.119	64	2	32	120	31.0	31.0
706	8	4	79	1916	84	37	54.720	-9	8	15.120	0	0	0	0.0	0.0	
706	8	4	79	2104	84	37	52.980	-9	8	59.580	0	0	0	0.0	0.0	
706	8	4	79	2124	84	37	51.960	-9	8	39.840	55	3	0	0.0	0.0	
30	8	4	79	2130	84	37	52.247	-9	8	36.673	55	2	28	120	37.0	21.0
22	8	4	79	2211	84	37	52.302	-9	9	12.516	56	3	22	130	45.0	35.0
22	8	4	79	2317	84	37	48.567	-9	8	23.970	60	2	35	120	26.0	21.0
30	9	4	79	104	84	37	44.282	-9	8	2.217	71	3	27	120	37.0	49.0
706	9	4	79	136	84	37	44.280	-9	7	46.680	60	3	0	0.0	0.0	
22	9	4	79	144	84	37	47.358	-9	7	49.734	60	3	15	130	54.0	46.0
706	9	4	79	220	84	37	41.580	-9	7	26.100	69	3	0	0.0	0.0	
22	9	4	79	437	84	37	31.428	-9	7	12.944	76	3	33	120	38.0	72.0
22	9	4	79	623	84	37	23.683	-9	7	34.364	64	3	31	120	38.0	32.0
706	9	4	79	656	84	37	21.720	-9	8	15.720	0	0	0	0.0	0.0	
706	9	4	79	744	84	37	15.420	-9	7	40.260	0	0	0	0.0	0.0	
706	9	4	79	804	84	37	12.180	-9	7	50.580	58	3	0	0.0	0.0	
22	9	4	79	809	84	37	12.861	-9	7	57.514	58	3	33	120	37.0	17.0
706	9	4	79	844	84	37	9.720	-9	7	48.180	65	2	0	0.0	0.0	
22	9	4	79	955	84	37	3.248	-9	7	31.003	58	2	24	120	43.0	21.0
706	9	4	79	1132	84	36	48.780	-9	7	13.680	65	3	0	0.0	0.0	
30	9	4	79	1140	84	36	50.779	-9	7	19.487	65	2	25	120	44.0	32.0
706	9	4	79	1454	84	36	26.040	-9	9	6.000	0	0	0	0.0	0.0	
706	9	4	79	1642	84	36	15.180	-9	9	52.380	0	0	0	0.0	0.0	
30	9	4	79	1700	84	36	16.062	-9	10	10.524	70	3	24	120	35.0	53.0
706	9	4	79	1730	84	36	10.440	-9	9	22.920	0	0	0	0.0	0.0	
706	9	4	79	1750	84	36	10.920	-9	9	59.640	62	3	0	0.0	0.0	
706	9	4	79	1828	84	36	8.040	-9	10	3.480	0	0	0	0.0	0.0	
30	9	4	79	1847	84	36	10.734	-9	10	47.273	59	2	23	120	36.0	31.0
706	9	4	79	1938	84	36	8.280	-9	10	52.380	55	3	0	0.0	0.0	
706	9	4	79	2014	84	36	8.100	-9	10	37.200	66	4	0	0.0	0.0	
30	9	4	79	2122	84	36	8.097	-9	10	47.630	58	2	27	130	39.0	28.0



## FRAM I

## NAVIGATION

SN	DT	HR	IN	GRT	LATITUDE		LONGITUDE		EL	I	DP	SAT	STDX	STOY		
706	9	4	79	2122	84	36	5.160	-9	10	39.720	53	3	0	0	0.0	0.0
30	9	4	79	2300	84	36	8.701	-9	10	38.992	54	2	20	130	48.0	22.0
706	10	4	79	139	84	36	2.940	-9	9	58.800	0	0	0	0	0.0	0.0
706	10	4	79	220	84	36	4.560	-9	10	50.700	0	0	0	0	0.0	0.0
706	10	4	79	240	84	36	0.420	-9	11	2.940	66	3	0	0	0.0	0.0
706	10	4	79	616	84	36	1.620	-9	10	50.460	0	0	0	0	0.0	0.0
706	10	4	79	758	84	36	2.040	-9	10	52.620	69	4	0	0	0.0	0.0
30	10	4	79	802	84	36	3.043	-9	11	16.847	69	3	14	130	51.0	64.0
706	10	4	79	842	84	35	58.260	-9	11	17.100	62	3	0	0	0.0	0.0
706	10	4	79	924	84	36	2.640	-9	12	27.660	0	0	0	0	0.0	0.0
706	10	4	79	1030	84	35	56.700	-9	11	6.180	57	3	0	0	0.0	0.0
706	10	4	79	1108	84	36	0.600	-9	10	45.120	0	0	0	0	0.0	0.0
706	10	4	79	1130	84	35	59.160	-9	10	40.320	0	0	0	0	0.0	0.0
30	10	4	79	1137	84	35	58.484	-9	10	30.862	59	2	30	130	38.0	26.0
30	10	4	79	1325	84	35	54.199	-9	10	25.541	63	3	22	130	44.0	34.0
706	10	4	79	1404	84	35	54.900	-9	10	33.540	0	0	0	0	0.0	0.0
706	10	4	79	1438	84	35	53.760	-9	9	54.000	56	3	0	0	0.0	0.0
706	10	4	79	1926	84	35	51.760	-9	10	5.400	0	0	0	0	0.0	0.0
706	10	4	79	2026	84	35	49.380	-9	10	2.100	61	3	0	0	0.0	0.0
706	10	4	79	2326	84	35	46.920	-9	9	51.240	64	3	0	0	0.0	0.0
22	11	4	79	638	84	35	48.926	-9	7	53.284	72	2	25	200	51.0	69.0
22	11	4	79	712	84	35	44.257	-9	6	53.814	74	3	20	130	61.0	85.0
706	11	4	79	752	84	35	45.720	-9	7	19.560	66	3	0	0	0.0	0.0
30	11	4	79	801	84	35	56.509	-9	7	30.295	66	3	23	190	50.0	53.0
706	11	4	79	1040	84	35	50.580	-9	4	29.220	59	3	0	0	0.0	0.0
706	11	4	79	1128	84	35	52.200	-9	3	13.080	0	0	0	0	0.0	0.0
30	11	4	79	1155	84	35	57.056	-9	2	59.578	62	3	33	200	44.0	37.0
706	11	4	79	1314	84	35	53.160	-8	59	7.980	0	0	0	0	0.0	0.0
30	11	4	79	1340	84	35	54.858	-8	59	47.009	56	3	34	200	47.0	23.0
706	11	4	79	1500	84	35	41.760	-8	58	16.380	0	0	0	0	0.0	0.0
706	11	4	79	1602	84	35	32.940	-8	58	6.780	0	0	0	0	0.0	0.0
30	11	4	79	2130	84	34	42.648	-8	54	40.682	57	3	26	130	36.0	26.0
706	11	4	79	2310	84	34	38.760	-8	53	44.340	55	3	0	0	0.0	0.0
706	12	4	79	142	84	34	32.160	-8	51	7.200	0	0	0	0	0.0	0.0
706	12	4	79	802	84	34	0.000	-8	50	1.140	0	0	0	0	0.0	0.0
30	12	4	79	811	84	34	4.061	-8	50	22.016	67	3	17	130	38.0	48.0
706	12	4	79	1034	84	34	0.660	-8	48	17.280	0	0	0	0	0.0	0.0
30	12	4	79	1041	84	34	0.675	-8	48	30.285	61	3	23	120	46.0	31.0
706	12	4	79	1140	84	33	58.020	-8	47	37.560	0	0	0	0	0.0	0.0
706	12	4	79	1222	84	34	0.000	-8	46	0.060	0	0	0	0	0.0	0.0
30	12	4	79	1227	84	33	58.678	-8	46	14.123	71	3	22	120	52.0	67.0
22	12	4	79	1334	84	33	52.600	-8	45	31.613	65	3	21	130	38.0	44.0
30	12	4	79	1746	84	33	12.810	-8	41	58.025	63	3	20	120	37.0	29.0
706	12	4	79	1934	84	32	44.280	-8	41	9.960	0	0	0	0	0.0	0.0
22	12	4	79	2304	84	31	57.444	-8	45	6.578	65	3	33	200	37.0	41.0
22	13	4	79	51	84	31	32.689	-8	46	46.876	57	3	24	200	51.0	44.0
22	13	4	79	423	84	31	5.204	-8	49	43.955	58	3	28	200	46.0	33.0
22	13	4	79	721	84	30	39.496	-8	52	11.557	72	3	16	130	45.0	75.0
706	13	4	79	954	84	30	9.060	-8	53	3.960	57	3	0	0	0.0	0.0
706	13	4	79	954	84	30	9.060	-8	53	3.960	57	3	0	0	0.0	0.0
706	13	4	79	954	84	30	9.060	-8	53	3.960	57	3	0	0	0.0	0.0
706	13	4	79	954	84	30	9.060	-8	53	3.960	57	3	0	0	0.0	0.0
22	13	4	79	1126	84	29	57.528	-8	54	2.539	64	3	24	200	48.0	54.0
22	13	4	79	1146	84	29	57.034	-8	54	9.667	57	3	28	190	52.0	27.0
706	13	4	79	1240	84	29	53.940	-8	53	31.080	0	0	0	0	0.0	0.0
706	13	4	79	1310	84	29	51.420	-8	54	22.680	0	0	0	0	0.0	0.0
22	13	4	79	1311	84	29	51.541	-8	54	30.747	56	3	25	200	59.0	35.0
22	13	4	79	1333	84	29	51.980	-8	54	16.979	62	3	32	190	51.0	39.0
22	13	4	79	1521	84	29	52.804	-8	55	33.602	74	3	33	190	46.0	84.0
706	13	4	79	1820	84	29	56.400	-8	57	32.520	0	0	0	0	0.0	0.0
22	13	4	79	1838	84	29	58.407	-8	58	14.092	58	3	19	120	61.0	47.0
30	13	4	79	1950	84	29	56.155	-8	59	29.122	54	3	26	140	51.0	30.0
22	13	4	79	1953	84	29	55.166	-8	58	55.778	63	3	27	130	40.0	40.0
22	13	4	79	2025	84	29	57.803	-8	59	0.028	54	3	21	120	47.0	23.0
30	13	4	79	2136	84	29	57.363	-9	0	27.995	53	3	25	140	39.0	24.0
22	13	4	79	2157	84	30	0.385	-9	0	53.208	73	3	29	200	48.0	87.0
22	13	4	79	2212	84	30	1.318	-9	0	38.535	57	3	23	120	42.0	22.0
22	13	4	79	2322	84	29	59.121	-9	1	59.600	59	3	20	140	50.0	51.0

## PRAM 1

## NAVIGATION

SR	DT	PR	TR	GR	LATITUDE		LONGITUDE		EL	I	DF	SAT	STDY	STDX
22	13	4	79	2343	84	30	3.131	-9	1	46.842	61	3 29 200	48.0	44.0
22	14	4	79	0	84	30	4.669	-9	1	33.404	65	3 25 120	36.0	34.0
22	14	4	79	129	84	30	15.106	-9	3	10.112	55	3 23 200	55.0	31.0
22	14	4	79	146	84	30	16.040	-9	2	11.342	80	3 21 120	34.0	79.0
22	14	4	79	316	84	30	29.224	-9	4	32.756	55	3 23 200	52.0	38.0
706	14	4	79	514	84	30	43.620	-9	6	45.360	68	3 0 0	0.0	0.0
30	14	4	79	630	84	30	53.943	-9	6	36.090	65	3 26 140	51.0	38.0
22	14	4	79	705	84	30	57.623	-9	7	33.344	59	3 26 120	39.0	24.0
22	14	4	79	817	84	31	8.115	-9	6	22.357	61	4 30 140	44.0	22.0
706	14	4	79	850	84	31	4.260	-9	9	0.600	0	0 0 0	0.0	0.0
30	14	4	79	851	84	31	6.577	-9	8	57.080	57	4 31 120	34.0	16.0
30	14	4	79	1005	84	31	19.266	-9	9	43.134	62	3 29 140	50.0	28.0
706	14	4	79	1018	84	31	11.820	-9	9	41.820	0	0 0 0	0.0	0.0
706	14	4	79	1032	84	31	16.260	-9	10	46.080	0	0 0 0	0.0	0.0
706	14	4	79	1032	84	31	16.260	-9	10	46.080	0	0 0 0	0.0	0.0
30	14	4	79	1056	84	31	21.736	-9	10	27.683	56	3 33 190	53.0	27.0
30	14	4	79	1222	84	31	25.858	-9	12	51.817	71	3 28 120	45.0	65.0
706	14	4	79	1520	84	31	45.440	-9	15	54.300	0	0 0 0	0.0	0.0
30	14	4	79	1555	84	31	46.183	-9	14	32.479	76	3 33 120	21.0	49.0
706	14	4	79	1612	84	31	44.820	-9	16	5.280	0	0 0 0	0.0	0.0
706	14	4	79	1612	84	31	44.820	-9	16	5.280	0	0 0 0	0.0	0.0
706	14	4	79	1856	84	31	42.360	-9	15	40.920	0	0 0 0	0.0	0.0
706	14	4	79	1944	84	31	39.640	-9	15	37.260	0	0 0 0	0.0	0.0
706	14	4	79	2038	84	31	41.400	-9	15	50.760	0	0 0 0	0.0	0.0
30	15	4	79	819	84	31	23.167	-9	15	27.102	62	3 36 190	52.0	44.0
706	15	4	79	936	84	31	21.840	-9	15	21.480	0	0 0 0	0.0	0.0
706	15	4	79	1050	84	31	17.640	-9	15	45.060	0	0 0 0	0.0	0.0
22	15	4	79	1057	84	31	19.816	-9	15	31.853	66	3 20 200	42.0	57.0
706	15	4	79	1120	84	31	18.240	-9	15	14.220	0	0 0 0	0.0	0.0
22	15	4	79	1127	84	31	19.376	-9	15	31.970	65	2 28 120	35.0	33.0
706	15	4	79	1146	84	31	17.760	-9	15	52.680	57	3 0 0	0.0	0.0
22	15	4	79	1155	84	31	20.145	-9	15	41.769	57	3 25 190	61.0	42.0
706	15	4	79	1234	84	31	16.900	-9	15	41.460	57	3 0 0	0.0	0.0
22	15	4	79	1242	84	31	17.948	-9	15	54.492	57	3 22 200	56.0	48.0
22	15	4	79	1342	84	31	18.442	-9	15	26.525	64	2 31 190	51.0	48.0
22	15	4	79	1427	84	31	19.596	-9	15	30.748	55	2 32 200	56.0	26.0
30	15	4	79	1440	84	31	15.476	-9	15	23.229	72	3 24 130	37.0	47.0
22	15	4	79	1612	84	31	16.575	-9	15	23.524	59	2 26 200	52.0	35.0
706	15	4	79	1644	84	31	7.960	-9	16	38.400	68	2 0 0	0.0	0.0
30	15	4	79	1646	84	31	16.245	-9	15	9.778	68	3 26 120	30.0	36.0
22	15	4	79	1757	84	31	17.509	-9	14	54.486	70	2 28 200	49.0	73.0
22	15	4	79	1834	84	31	16.520	-9	15	4.724	58	2 32 120	29.0	22.0
706	15	4	79	1946	84	31	15.180	-9	15	15.720	53	4 0 0	0.0	0.0
22	15	4	79	2001	84	31	12.894	-9	15	12.531	62	3 27 130	34.0	40.0
22	15	4	79	2021	84	31	14.542	-9	15	9.036	54	3 22 120	36.0	25.0
22	15	4	79	2050	84	31	13.059	-9	15	6.290	61	3 32 190	62.0	44.0
22	15	4	79	2148	84	31	13.773	-9	15	10.719	55	3 21 130	47.0	35.0
30	15	4	79	2208	84	31	11.796	-9	14	50.346	57	3 22 120	51.0	35.0
706	15	4	79	2306	84	31	13.500	-9	15	16.200	63	3 0 0	0.0	0.0
22	15	4	79	2314	84	31	14.542	-9	14	54.246	63	2 26 200	47.0	53.0
22	15	4	79	2334	84	31	12.839	-9	15	5.335	55	2 24 130	33.0	20.0
22	15	4	79	2355	84	31	11.576	-9	15	2.967	65	2 16 120	44.0	68.0
706	16	4	79	56	84	31	12.240	-9	14	45.360	56	4 0 0	0.0	0.0
22	16	4	79	120	84	31	11.960	-9	14	57.741	60	2 22 130	38.0	53.0
22	16	4	79	246	84	31	11.027	-9	14	46.473	54	2 31 200	44.0	25.0
22	16	4	79	307	84	31	5.479	-9	16	18.600	71	2 24 130	37.0	66.0
22	16	4	79	433	84	31	10.642	-9	14	32.390	59	3 33 200	49.0	40.0
22	16	4	79	514	84	31	8.994	-9	14	39.545	68	2 17 120	58.0	62.0
22	16	4	79	619	84	31	9.873	-9	14	40.266	71	2 27 200	39.0	64.0
22	16	4	79	640	84	31	11.191	-9	14	15.478	75	3 21 130	38.0	57.0
22	16	4	79	700	84	31	8.884	-9	14	35.418	59	3 22 120	44.0	27.0
706	16	4	79	728	84	31	6.600	-9	13	54.540	0	0 0 0	0.0	0.0
22	16	4	79	730	84	31	10.807	-9	14	14.894	66	3 31 190	46.0	45.0
706	16	4	79	844	84	31	5.340	-9	14	54.360	0	0 0 0	0.0	0.0
706	16	4	79	914	84	31	7.680	-9	14	26.340	58	3 0 0	0.0	0.0
22	16	4	79	918	84	31	8.445	-9	14	24.954	58	3 34 190	56.0	38.0
22	16	4	79	1016	84	31	6.852	-9	14	26.945	58	3 24 130	41.0	23.0
30	16	4	79	1032	84	31	7.456	-9	14	27.681	61	3 26 120	34.0	24.0

## FRAM 1

## NAVIGATION

SH	UT	MN	TR	GAT	LATITUDE			LONGITUDE			EL	1	DP	SAT	STDY	STDZ
22	16	4	79	1106	84	31	7.676	-9	14	25.942	56	2	33	190	50.0	26.0
706	16	4	79	1128	84	31	7.140	-9	14	54.300	62	3	0	0	0.0	0.0
22	16	4	79	1135	84	31	7.621	-9	14	22.530	62	3	22	200	55.0	79.0
22	16	4	79	1204	84	31	6.687	-9	14	34.141	60	2	20	130	50.0	34.0
30	16	4	79	1320	84	31	6.193	-9	14	30.632	56	3	23	200	52.0	27.0
30	16	4	79	1738	84	31	7.731	-9	14	59.512	62	4	14	120	46.0	56.0
706	16	4	79	1808	84	31	8.100	-9	15	44.040	0	0	0	0	0.0	0.0
706	16	4	79	1828	84	31	6.600	-9	13	37.060	0	0	0	0	0.0	0.0
30	16	4	79	1812	84	31	6.193	-9	14	45.237	67	3	25	130	41.0	52.0
706	16	4	79	1918	84	31	5.940	-9	14	56.460	0	0	0	0	0.0	0.0
30	16	4	79	1925	84	31	6.083	-9	14	37.554	55	3	23	120	42.0	28.0
22	16	4	79	2059	84	31	6.742	-9	14	50.977	57	4	23	130	46.0	30.0
22	16	4	79	2245	84	31	7.450	-9	14	43.678	54	3	24	130	40.0	20.0
706	16	4	79	2254	84	31	6.420	-9	14	21.780	0	0	0	0	0.0	0.0
30	16	4	79	2300	84	31	5.533	-9	14	37.472	60	4	26	120	40.0	26.0
30	16	4	79	2352	84	31	6.248	-9	14	36.736	59	3	24	200	47.0	37.0
22	17	4	79	31	84	31	5.753	-9	14	41.193	57	3	22	130	63.0	26.0
22	17	4	79	216	84	31	5.039	-9	14	46.130	66	2	26	130	41.0	49.0
30	17	4	79	625	84	31	4.874	-9	14	32.953	62	3	23	120	56.0	34.0
22	17	4	79	641	84	31	5.204	-9	14	50.964	72	4	31	190	44.0	77.0
30	17	4	79	739	84	31	3.281	-9	15	9.853	76	1	28	130	32.0	37.0
22	17	4	79	808	84	31	2.292	-9	15	12.504	61	2	29	190	55.0	38.0
706	17	4	79	908	84	31	3.900	-9	15	21.360	0	0	0	0	0.0	0.0
22	17	4	79	926	84	31	5.039	-9	15	18.986	60	2	17	130	50.0	32.0
706	17	4	79	930	84	31	3.720	-9	15	7.800	58	3	0	0	0.0	0.0
22	17	4	79	1114	84	31	2.567	-9	15	29.642	58	3	22	130	53.0	44.0
30	17	4	79	1204	84	31	3.446	-9	15	40.958	57	3	35	190	48.0	29.0
30	17	4	79	1302	84	31	4.545	-9	15	48.292	63	3	29	130	34.0	27.0
22	17	4	79	1449	84	31	8.115	-9	16	32.759	75	2	23	130	44.0	58.0
30	17	4	79	1823	84	31	12.345	-9	20	11.552	72	3	24	130	32.0	73.0
22	17	4	79	2200	84	31	19.761	-9	23	38.156	55	2	26	130	46.0	30.0
30	17	4	79	2342	84	31	21.738	-9	25	8.162	55	3	25	130	38.0	21.0
22	18	4	79	129	84	31	21.738	-9	27	25.367	61	3	18	130	55.0	83.0
30	18	4	79	550	84	31	30.033	-9	30	0.089	68	3	28	200	51.0	63.0
22	18	4	79	649	84	31	30.967	-9	31	46.094	73	3	19	130	45.0	60.0
30	18	4	79	1024	84	31	30.527	-9	34	55.017	58	4	22	130	45.0	19.0
706	18	4	79	1024	84	31	26.460	-9	35	12.780	61	3	0	0	0.0	0.0
706	18	4	79	1058	84	31	24.540	-9	35	30.420	0	0	0	0	0.0	0.0
706	18	4	79	1420	84	31	18.600	-9	37	37.740	0	0	0	0	0.0	0.0
706	18	4	79	1614	84	31	14.160	-9	37	55.980	0	0	0	0	0.0	0.0
706	18	4	79	1858	84	31	4.260	-9	38	6.060	0	0	0	0	0.0	0.0
706	18	4	79	1858	84	31	4.260	-9	38	6.060	0	0	0	0	0.0	0.0
706	18	4	79	1858	84	31	4.260	-9	38	6.060	0	0	0	0	0.0	0.0
706	18	4	79	1858	84	31	4.260	-9	38	6.060	0	0	0	0	0.0	0.0
706	18	4	79	1858	84	31	4.260	-9	38	6.060	0	0	0	0	0.0	0.0
706	18	4	79	2104	84	30	53.940	-9	37	51.420	0	0	0	0	0.0	0.0
706	18	4	79	2230	84	30	50.520	-9	37	23.760	0	0	0	0	0.0	0.0
706	18	4	79	2250	84	30	47.700	-9	37	46.740	54	3	0	0	0.0	0.0
30	18	4	79	2323	84	30	46.967	-9	37	19.783	61	3	25	200	39.0	38.0
22	19	4	79	23	84	30	46.912	-9	36	28.092	67	3	33	140	47.0	67.0
22	19	4	79	110	84	30	25.214	-9	36	28.985	54	2	22	200	60.0	44.0
22	19	4	79	255	84	30	25.104	-9	36	25.455	54	3	30	200	52.0	34.0
22	19	4	79	442	84	30	33.014	-9	36	26.231	61	3	33	200	41.0	37.0
22	19	4	79	544	84	30	28.729	-9	35	40.102	68	3	31	140	51.0	41.0
706	19	4	79	642	84	30	25.620	-9	36	52.740	69	3	0	0	0.0	0.0
30	19	4	79	650	84	30	24.609	-9	35	43.295	69	2	31	190	42.0	62.0
22	19	4	79	732	84	30	28.015	-9	35	58.038	61	2	33	140	44.0	20.0
706	19	4	79	744	84	30	17.520	-9	35	20.820	0	0	0	0	0.0	0.0
30	19	4	79	747	84	30	19.006	-9	36	41.488	57	2	28	120	43.0	22.0
22	19	4	79	748	84	30	25.928	-9	36	31.834	66	2	16	130	59.0	57.0
706	19	4	79	952	84	30	14.040	-9	37	11.820	0	0	0	0	0.0	0.0
22	19	4	79	1458	84	29	52.365	-9	36	7.774	77	3	22	130	37.0	74.0
30	19	4	79	1659	84	29	41.708	-9	37	20.627	64	3	29	200	51.0	50.0
22	19	4	79	1814	84	29	42.104	-9	36	58.353	57	2	33	140	41.0	29.0
706	19	4	79	1826	84	29	38.100	-9	36	44.700	70	3	0	0	0.0	0.0
22	19	4	79	1832	84	29	39.620	-9	36	19.825	70	2	23	130	54.0	78.0
706	19	4	79	1914	84	29	35.220	-9	36	35.940	67	3	0	0	0.0	0.0
22	19	4	79	1922	84	29	34.786	-9	36	32.933	67	3	33	190	56.0	63.0



## FRAM 1

## NAVIGATION

SN	DT	MM	TR	GMT	LATITUDE		LONGITUDE		EL	I	DP	SAT	STDY	STDX
22	19	4	79	2000	84	29	35.336	-9	36	40.486	53	2 25 140	43.0	32.0
22	19	4	79	2018	84	29	32.309	-9	36	41.935	59	3 26 130	27.0	24.0
22	19	4	79	2108	84	29	29.238	-9	36	29.671	58	3 33 190	60.0	34.0
22	19	4	79	2205	84	29	25.997	-9	36	14.696	54	3 27 130	54.0	41.0
30	19	4	79	2216	84	29	24.240	-9	35	37.287	67	3 27 200	40.0	51.0
22	20	4	79	41	84	29	14.681	-9	35	43.391	61	3 34 190	52.0	36.0
22	20	4	79	452	84	28	56.334	-9	34	11.944	72	3 23 140	45.0	67.0
22	20	4	79	639	84	28	43.480	-9	33	14.664	63	3 24 140	55.0	33.0
30	20	4	79	652	84	28	36.559	-9	32	53.681	59	3 28 120	38.0	22.0
22	20	4	79	658	84	28	41.667	-9	33	3.156	71	3 15 130	54.0	70.0
30	20	4	79	748	84	28	31.230	-9	31	48.662	63	3 36 190	45.0	41.0
22	20	4	79	827	84	28	30.681	-9	31	57.355	60	3 26 140	60.0	26.0
22	20	4	79	936	84	28	19.640	-9	30	42.730	56	3 36 190	43.0	24.0
22	20	4	79	1014	84	28	14.257	-9	30	13.733	64	3 32 140	38.0	25.0
30	20	4	79	1037	84	28	7.061	-9	29	13.191	65	3 23 200	55.0	51.0
22	20	4	79	1124	84	28	2.281	-9	29	8.824	56	3 35 190	43.0	24.0
22	20	4	79	1202	84	27	58.898	-9	28	53.100	74	3 25 140	61.0	68.0
30	20	4	79	1312	84	27	39.155	-9	27	56.534	61	3 35 190	45.0	40.0
22	20	4	79	1536	84	27	16.414	-9	22	57.040	73	3 31 140	39.0	79.0
22	20	4	79	1722	84	26	59.165	-9	21	1.512	60	3 30 140	41.0	37.0
706	20	4	79	1734	84	26	58.860	-9	19	54.720	0	0 0 0	0.0	0.0
706	20	4	79	1826	84	26	45.600	-9	19	28.140	0	0 0 0	0.0	0.0
706	20	4	79	1902	84	26	42.840	-9	18	45.000	0	0 0 0	0.0	0.0
706	20	4	79	2012	84	26	31.600	-9	17	26.460	0	0 0 0	0.0	0.0
706	20	4	79	2046	84	26	27.720	-9	16	28.560	0	0 0 0	0.0	0.0
706	20	4	79	2046	84	26	27.720	-9	16	28.560	0	0 0 0	0.0	0.0
706	20	4	79	2046	84	26	27.720	-9	16	28.560	0	0 0 0	0.0	0.0
706	20	4	79	2106	84	26	24.900	-9	16	31.260	0	0 0 0	0.0	0.0
706	21	4	79	540	84	25	30.120	-9	8	38.220	66	3 0 0	0.0	0.0
22	21	4	79	547	84	25	30.505	-9	8	8.919	66	3 19 140	63.0	53.0
22	21	4	79	756	84	25	16.553	-9	5	59.129	64	2 25 130	38.0	36.0
22	21	4	79	922	84	25	4.468	-9	4	45.219	61	2 20 140	56.0	47.0
22	21	4	79	944	84	25	4.413	-9	4	1.294	58	2 28 130	40.0	30.0
22	21	4	79	1034	84	24	56.338	-9	3	10.160	55	3 24 190	55.0	34.0
22	21	4	79	1110	84	24	52.657	-9	2	53.090	69	2 21 140	55.0	49.0
22	21	4	79	1132	84	24	50.680	-9	2	7.332	59	3 28 130	46.0	24.0
22	21	4	79	1222	84	24	42.605	-9	0	48.848	58	3 29 190	53.0	46.0
22	21	4	79	1319	84	24	32.992	-9	0	6.496	66	2 25 130	48.0	37.0
22	21	4	79	1410	84	24	25.192	-8	59	6.709	68	3 31 190	49.0	70.0
22	21	4	79	2027	84	23	24.932	-8	50	11.366	57	3 26 130	36.0	19.0
22	21	4	79	2146	84	23	14.275	-8	48	41.230	69	3 21 200	50.0	72.0
22	21	4	79	2213	84	23	13.451	-8	48	6.651	54	3 31 130	34.0	20.0
22	21	4	79	2304	84	23	6.604	-8	47	4.791	56	3 33 190	57.0	29.0
22	21	4	79	2335	84	23	4.991	-8	45	38.679	63	3 18 140	55.0	66.0
22	21	4	79	2359	84	22	59.333	-8	45	47.722	56	3 31 130	28.0	19.0
22	22	4	79	146	84	22	48.182	-8	43	11.380	64	4 30 130	38.0	48.0
22	22	4	79	305	84	22	33.076	-8	42	43.797	54	2 28 200	53.0	42.0
22	22	4	79	452	84	22	17.860	-8	41	34.130	62	2 30 200	39.0	41.0
706	22	4	79	658	84	21	56.540	-8	39	29.640	68	3 0 0	0.0	0.0
22	22	4	79	707	84	21	59.788	-8	39	31.694	68	2 25 130	35.0	44.0
706	22	4	79	816	84	21	47.700	-8	38	42.000	68	3 0 0	0.0	0.0
706	22	4	79	846	84	21	39.420	-8	37	27.420	0	0 0 0	0.0	0.0
706	22	4	79	846	84	21	39.420	-8	37	27.420	0	0 0 0	0.0	0.0
706	22	4	79	846	84	21	39.420	-8	37	27.420	0	0 0 0	0.0	0.0
706	22	4	79	846	84	21	39.420	-8	37	27.420	0	0 0 0	0.0	0.0
706	22	4	79	846	84	21	39.420	-8	37	27.420	0	0 0 0	0.0	0.0
22	22	4	79	854	84	21	42.814	-8	37	1.751	60	3 22 130	37.0	33.0
22	22	4	79	946	84	21	33.585	-8	36	27.529	55	3 27 190	46.0	28.0
22	22	4	79	1008	84	21	33.036	-8	35	36.738	67	4 28 200	53.0	64.0
30	22	4	79	1042	84	21	26.719	-8	35	7.349	58	3 35 130	27.0	15.0
706	22	4	79	1126	84	21	18.360	-8	34	24.060	55	3 0 0	0.0	0.0
30	22	4	79	1133	84	21	16.611	-8	34	11.621	55	3 34 190	48.0	30.0
30	22	4	79	1153	84	21	18.369	-8	33	24.922	56	3 32 200	51.0	34.0
22	22	4	79	1230	84	21	8.921	-8	33	8.608	62	3 29 130	34.0	24.0
22	22	4	79	1321	84	21	1.945	-8	32	16.368	63	3 29 190	44.0	49.0
22	22	4	79	1338	84	21	3.922	-8	31	10.167	53	3 25 200	39.0	21.0
22	22	4	79	1418	84	20	53.046	-8	31	29.909	73	3 25 130	26.0	39.0
22	22	4	79	1523	84	20	47.223	-8	28	59.953	56	3 22 200	59.0	47.0



## FRAM I

## NAVIGATION

SN	DI	AN	IK	GRI	LATITUDE			LONGITUDE			EL	I	DP	SAT	STDY	STDZ
706	22	4	79	1708	84	20	25.860	-8	27	35.520	66	3	0	0	0.0	0.0
30	22	4	79	1752	84	20	20.636	-8	26	27.044	73	3	25	130	40.0	68.0
22	22	4	79	1842	84	20	16.846	-8	25	56.790	69	3	32	190	53.0	75.0
706	22	4	79	1904	84	20	13.560	-8	25	33.660	53	3	0	0	0.0	0.0
30	22	4	79	1911	84	20	13.440	-8	25	35.271	53	3	29	140	38.0	18.0
706	22	4	79	1936	84	20	6.480	-8	25	18.480	61	2	0	0	0.0	0.0
30	22	4	79	1938	84	20	9.540	-8	25	17.061	61	3	25	130	32.0	28.0
22	22	4	79	2028	84	20	5.200	-8	24	31.323	59	3	28	190	56.0	43.0
30	22	4	79	2057	84	20	3.992	-8	24	24.519	53	2	35	140	37.0	20.0
30	22	4	79	2124	84	20	1.959	-8	24	8.726	54	3	26	130	35.0	22.0
30	22	4	79	2215	84	20	0.256	-8	23	45.531	55	2	33	190	46.0	21.0
706	22	4	79	2236	84	19	57.600	-8	23	3.300	58	4	0	0	0.0	0.0
30	22	4	79	2243	84	19	58.499	-8	23	18.360	58	2	35	140	33.0	29.0
30	22	4	79	2310	84	19	57.070	-8	23	16.877	45	2	25	130	43.0	27.0
30	23	4	79	1	84	19	56.136	-8	22	35.212	58	2	29	190	45.0	31.0
30	23	4	79	29	84	19	54.763	-8	22	27.665	70	3	31	140	40.0	68.0
30	23	4	79	57	84	19	54.763	-8	22	28.888	60	3	27	130	40.0	34.0
30	23	4	79	148	84	19	52.456	-8	21	51.184	68	3	30	190	56.0	72.0
30	23	4	79	243	84	19	52.072	-8	21	37.046	72	3	26	130	36.0	68.0
30	23	4	79	520	84	19	41.305	-8	20	47.745	64	3	27	140	43.0	29.0
706	23	4	79	610	84	19	34.140	-8	20	59.700	0	0	0	0	0.0	0.0
30	23	4	79	617	84	19	40.371	-8	20	41.922	74	3	24	130	48.0	67.0
706	23	4	79	700	84	19	34.380	-8	20	15.300	0	0	0	0	0.0	0.0
30	23	4	79	708	84	19	37.899	-8	20	20.718	64	3	30	190	36.0	37.0
30	23	4	79	805	84	19	34.933	-8	19	34.315	62	3	23	130	41.0	45.0
706	23	4	79	916	84	19	21.660	-8	19	45.000	0	0	0	0	0.0	0.0
30	23	4	79	1110	84	19	29.989	-8	17	39.789	66	2	23	120	48.0	50.0
706	23	4	79	1956	84	19	3.180	-8	14	54.720	0	0	0	0	0.0	0.0
706	23	4	79	1956	84	19	3.180	-8	14	54.720	0	0	0	0	0.0	0.0
706	23	4	79	2028	84	19	9.900	-8	14	40.860	56	3	0	0	0.0	0.0
706	24	4	79	636	84	19	1.020	-8	13	54.120	58	3	0	0	0.0	0.0
22	24	4	79	903	84	18	58.733	-8	13	21.343	59	3	26	130	41.0	21.0
22	24	4	79	939	84	18	58.348	-8	13	23.066	69	3	27	200	56.0	78.0
22	24	4	79	955	84	18	58.239	-8	13	1.753	54	3	20	190	60.0	34.0
22	24	4	79	1014	84	19	0.930	-8	12	32.323	61	3	17	120	59.0	57.0
22	24	4	79	1051	84	18	57.250	-8	12	40.069	58	3	21	130	51.0	29.0
706	24	4	79	1118	84	18	56.400	-8	13	18.300	0	0	0	0	0.0	0.0
22	24	4	79	1124	84	18	57.305	-8	13	5.316	57	3	31	200	45.0	33.0
22	24	4	79	1142	84	18	56.371	-8	12	32.502	56	3	32	190	44.0	29.0
22	24	4	79	1200	84	18	56.536	-8	12	57.200	73	3	25	120	46.0	75.0
22	24	4	79	1238	84	18	54.338	-8	12	38.338	63	3	29	130	44.0	34.0
22	24	4	79	1309	84	18	57.909	-8	12	35.736	53	3	23	200	53.0	31.0
22	24	4	79	1330	84	18	54.833	-8	12	26.555	64	3	26	190	47.0	46.0
706	24	4	79	1510	84	18	53.340	-8	12	32.340	0	0	0	0	0.0	0.0
706	24	4	79	1530	84	18	52.740	-8	11	44.340	0	0	0	0	0.0	0.0
706	24	4	79	1656	84	18	6.660	-8	10	49.320	0	0	0	0	0.0	0.0
22	24	4	79	1841	84	18	45.330	-8	10	50.404	66	8	32	190	59.0	64.0
22	24	4	79	2055	84	18	43.572	-8	10	4.983	54	3	26	120	34.0	21.0
22	24	4	79	2156	84	18	47.307	-8	11	2.125	65	3	32	200	41.0	50.0
22	24	4	79	2242	84	18	36.705	-8	10	14.754	61	3	22	120	50.0	48.0
22	24	4	79	2319	84	18	41.155	-8	9	45.372	54	3	29	130	33.0	22.0
22	24	4	79	2342	84	18	38.848	-8	9	27.300	55	3	30	200	39.0	29.0
22	25	4	79	10	84	18	39.781	-8	9	19.184	59	3	23	190	53.0	44.0
22	25	4	79	105	84	18	37.310	-8	9	30.005	61	3	27	130	43.0	42.0
22	25	4	79	128	84	18	37.969	-8	9	16.993	51	3	31	200	43.0	25.0
22	25	4	79	156	84	18	34.673	-8	10	6.143	70	3	33	190	55.0	77.0
22	25	4	79	314	84	18	37.914	-8	8	38.953	54	3	31	200	48.0	34.0
22	25	4	79	501	84	18	34.178	-8	8	10.979	64	3	25	200	49.0	58.0
22	25	4	79	548	84	18	28.081	-8	8	30.068	60	3	29	120	51.0	36.0
22	25	4	79	626	84	18	28.575	-8	8	5.445	72	3	26	130	54.0	60.0
22	25	4	79	718	84	18	31.212	-8	8	26.071	62	3	29	190	51.0	50.0
22	25	4	79	734	84	18	22.753	-8	8	4.147	56	3	22	120	51.0	26.0
22	25	4	79	814	84	18	26.873	-8	8	16.596	61	3	33	130	38.0	27.0
22	25	4	79	906	84	18	24.840	-8	7	41.371	55	3	24	190	61.0	28.0
22	25	4	79	1001	84	18	22.533	-8	7	7.588	57	3	29	130	42.0	31.0
706	25	4	79	1014	84	18	18.660	-8	7	20.220	0	0	0	0	0.0	0.0
22	25	4	79	1018	84	18	20.775	-8	7	24.212	63	3	29	200	42.0	43.0
706	25	4	79	1046	84	18	20.160	-8	6	59.340	54	3	0	0	0.0	0.0

## FRAM 1

## NAVIGATION

SN	DY	MN	YR	GMT	LATITUDE		LONGITUDE		EL	1	DP	SAT	STDY	STDX		
22	25	4	79	1053	84	18	21.434	-8	6	22.530	54	3	33	190	49.0	28.0
22	25	4	79	1149	84	18	19.512	-8	6	29.767	60	3	29	130	38.0	23.0
22	25	4	79	1241	84	18	15.447	-8	6	27.083	60	3	32	190	47.0	39.0
22	25	4	79	1337	84	18	12.920	-8	6	53.573	73	5	21	130	45.0	65.0
22	25	4	79	1428	84	18	13.524	-8	6	12.910	72	3	30	190	38.0	72.0
706	25	4	79	1628	84	18	9.960	-8	5	36.240	62	2	0	0	0.0	0.0
22	25	4	79	1636	84	18	10.668	-8	5	36.834	62	3	32	140	37.0	43.0
706	25	4	79	1704	84	18	7.620	-8	5	37.500	0	0	0	0	0.0	0.0
22	25	4	79	1802	84	18	7.427	-8	4	57.249	72	3	27	190	49.0	77.0
22	25	4	79	1822	84	18	6.768	-8	4	44.429	54	3	30	140	51.0	30.0
22	25	4	79	2008	84	17	56.770	-8	4	41.923	52	3	35	140	37.0	19.0
22	25	4	79	2044	84	17	56.935	-8	4	20.506	55	4	20	130	47.0	37.0
22	25	4	79	2135	84	17	52.760	-8	4	0.642	55	3	32	190	46.0	22.0
22	25	4	79	2154	84	17	51.167	-8	3	50.088	56	4	33	140	44.0	33.0
706	25	4	79	2222	84	17	51.480	-8	3	26.160	53	3	0	0	0.0	0.0
22	25	4	79	2322	84	17	51.057	-8	3	5.161	56	4	33	190	54.0	28.0
22	25	4	79	2341	84	17	49.135	-8	3	2.133	65	3	28	140	35.0	45.0
22	26	4	79	108	84	17	47.871	-8	2	39.068	64	3	32	190	55.0	52.0
22	26	4	79	501	84	17	44.026	-8	2	42.323	67	3	35	140	38.0	35.0
22	26	4	79	628	84	17	39.741	-8	2	43.305	67	3	30	190	46.0	53.0
706	26	4	79	640	84	17	34.860	-8	2	46.600	0	0	0	0	0.0	0.0
22	26	4	79	649	84	17	40.455	-8	2	36.603	60	3	30	140	42.0	25.0
706	26	4	79	808	84	17	31.740	-8	2	37.440	0	0	0	0	0.0	0.0
22	26	4	79	816	84	17	37.819	-8	2	27.883	57	3	29	190	43.0	27.0
22	26	4	79	836	84	17	36.610	-8	1	54.478	60	3	35	140	45.0	22.0
706	26	4	79	956	84	17	34.500	-8	1	41.820	53	3	0	0	0.0	0.0
22	26	4	79	1004	84	17	35.017	-8	1	31.351	53	3	29	190	48.0	27.0
22	26	4	79	1024	84	17	32.600	-8	1	39.522	66	3	36	140	45.0	39.0
22	26	4	79	1056	84	17	37.928	-8	0	54.403	59	3	24	200	50.0	34.0
22	26	4	79	1247	84	17	25.679	-8	1	9.784	65	3	21	130	41.0	43.0
22	26	4	79	1339	84	17	34.907	-7	59	44.142	66	3	30	190	41.0	45.0
22	26	4	79	1435	84	17	30.897	-8	1	6.673	78	3	27	130	47.0	78.0
706	26	4	79	1726	84	17	35.220	-8	0	25.500	0	0	0	0	0.0	0.0
706	26	4	79	1852	84	17	3.660	-8	0	15.540	0	0	0	0	0.0	0.0
22	26	4	79	2103	84	17	25.459	-7	59	58.115	53	3	28	140	39.0	26.0
706	26	4	79	2120	84	17	23.040	-8	0	43.380	0	0	0	0	0.0	0.0
22	26	4	79	2141	84	17	25.404	-7	59	51.026	53	3	21	130	59.0	27.0
22	26	4	79	2233	84	17	23.536	-7	59	36.287	55	3	27	190	54.0	30.0
22	26	4	79	2328	84	17	24.141	-7	59	9.133	55	3	25	130	44.0	35.0
22	27	4	79	19	84	17	24.635	-7	59	4.210	60	3	30	190	58.0	51.0
22	27	4	79	114	84	17	24.250	-7	58	25.741	63	3	21	130	49.0	43.0
22	27	4	79	409	84	17	24.635	-7	58	15.026	73	3	24	140	49.0	70.0
22	27	4	79	635	84	17	20.845	-7	58	10.820	69	3	17	130	31.0	48.0
706	27	4	79	720	84	17	16.080	-7	59	10.080	0	0	0	0	0.0	0.0
706	27	4	79	720	84	17	16.080	-7	59	10.080	0	0	0	0	0.0	0.0
22	27	4	79	727	84	17	18.593	-7	57	36.065	60	3	20	190	42.0	41.0
22	27	4	79	822	84	17	17.439	-7	58	13.594	60	3	23	130	45.0	46.0
22	27	4	79	932	84	17	13.868	-7	57	59.738	62	3	27	140	52.0	26.0
22	27	4	79	1010	84	17	12.275	-7	57	46.035	57	3	25	130	45.0	31.0
22	27	4	79	1102	84	17	13.319	-7	57	38.905	54	3	27	190	44.0	27.0
22	27	4	79	1119	84	17	11.122	-7	57	42.139	72	3	24	140	54.0	62.0
30	27	4	79	1134	84	17	15.516	-7	56	57.965	55	2	29	200	38.0	25.0
30	27	4	79	1158	84	17	16.395	-7	57	6.763	61	2	32	130	35.0	29.0
30	27	4	79	1318	84	17	16.945	-7	57	42.949	52	2	30	200	37.0	18.0
30	27	4	79	1346	84	17	16.505	-7	56	13.428	72	2	27	130	45.0	55.0
706	27	4	79	1446	84	17	13.860	-7	57	44.160	0	0	0	0	0.0	0.0
30	27	4	79	1503	84	17	17.988	-7	57	28.560	55	2	31	200	40.0	26.0
30	27	4	79	1620	84	17	18.538	-7	58	23.492	65	3	22	120	37.0	52.0
30	27	4	79	1648	84	17	19.032	-7	57	10.327	65	2	29	200	50.0	58.0
22	27	4	79	1720	84	17	13.429	-7	58	12.197	74	3	28	130	27.0	64.0
22	27	4	79	1807	84	17	15.022	-7	58	22.685	56	4	27	120	37.0	21.0
22	27	4	79	1825	84	17	15.077	-7	58	47.439	53	3	26	140	54.0	26.0
30	27	4	79	1906	84	17	17.878	-7	59	37.306	61	3	32	130	39.0	35.0
30	27	4	79	1954	84	17	20.460	-7	58	41.853	53	2	30	120	29.0	17.0
30	27	4	79	2052	84	17	20.405	-7	59	44.290	54	2	23	130	53.0	28.0
22	27	4	79	2142	84	17	16.121	-7	59	4.241	57	3	32	120	36.0	26.0
22	27	4	79	2158	84	17	17.164	-7	59	13.992	56	3	17	140	55.0	48.0
30	27	4	79	2205	84	17	20.405	-8	0	9.730	62	2	29	200	37.0	41.0

## FRAM 1

## NAVIGATION

SN	DT	PN	IN	GRI	LATITUDE	LONGITUDE	EL	I	DP	SAT	STDY	STDX
30	27	4	79	2239	84 17 21.888	-7 59 23.900	54	3	19	130	54.0	28.0
30	27	4	79	2351	84 17 21.284	-7 59 55.214	53	3	29	200	42.0	26.0
22	28	4	79	25	84 17 15.826	-7 59 55.029	59	3	18	130	34.0	32.0
30	28	4	79	324	84 17 26.613	-8 0 5.177	55	3	26	200	43.0	40.0
30	28	4	79	448	84 17 28.480	-8 2 34.124	64	2	27	120	33.0	33.0
22	28	4	79	504	84 17 25.349	-8 1 14.398	66	3	25	140	47.0	44.0
30	28	4	79	510	84 17 27.766	-8 0 9.606	67	2	22	200	43.0	51.0
30	28	4	79	546	84 17 29.249	-8 3 23.494	75	3	33	130	31.0	59.0
30	28	4	79	634	84 17 29.139	-8 2 49.395	57	2	28	120	39.0	20.0
30	28	4	79	733	84 17 30.842	-8 3 18.489	63	3	36	130	31.0	25.0
22	28	4	79	820	84 17 25.184	-8 3 5.278	56	4	26	120	39.0	23.0
22	28	4	79	840	84 17 24.690	-8 2 55.115	60	3	24	140	43.0	21.0
22	28	4	79	920	84 17 24.086	-8 3 5.937	57	3	31	130	36.0	19.0
30	28	4	79	1006	84 17 29.414	-8 2 38.595	62	3	28	120	48.0	35.0
30	28	4	79	1026	84 17 28.261	-8 4 14.903	61	3	26	200	42.0	43.0
22	28	4	79	1106	84 17 22.877	-8 3 19.622	59	3	34	130	31.0	20.0
22	28	4	79	1212	84 17 22.108	-8 3 43.187	53	3	28	200	47.0	26.0
30	28	4	79	1256	84 17 25.844	-8 2 48.826	66	2	34	130	38.0	39.0
22	28	4	79	1350	84 17 22.822	-8 3 40.647	52	3	27	200	56.0	32.0
22	28	4	79	1524	84 17 21.998	-8 4 10.145	71	3	26	120	26.0	49.0
22	28	4	79	1541	84 17 22.657	-8 3 58.321	58	3	17	200	49.0	49.0
30	28	4	79	1712	84 17 23.317	-8 5 20.567	59	2	32	120	30.0	24.0
30	28	4	79	1817	84 17 21.724	-8 5 57.941	66	3	28	130	34.0	53.0
30	28	4	79	1859	84 17 21.394	-8 5 0.105	54	2	26	120	36.0	20.0
30	28	4	79	2004	84 17 18.757	-8 5 26.843	57	2	32	130	33.0	24.0
30	28	4	79	2046	84 17 15.901	-8 4 46.537	55	2	32	120	34.0	24.0
30	28	4	79	2150	84 17 13.594	-8 4 59.233	53	3	28	130	37.0	18.0
30	28	4	79	2233	84 17 9.639	-8 4 23.754	62	2	34	120	28.0	28.0
30	28	4	79	2252	84 17 9.803	-8 4 0.305	62	3	29	140	36.0	46.0
22	28	4	79	2336	84 17 3.431	-8 4 52.504	56	3	33	130	33.0	22.0
30	29	4	79	122	84 17 3.706	-8 3 35.449	65	2	36	130	31.0	38.0
30	29	4	79	353	84 16 57.554	-8 5 57.152	70	2	28	120	45.0	60.0
30	29	4	79	412	84 16 56.730	-8 5 56.342	71	2	34	140	41.0	52.0
30	29	4	79	539	84 16 49.753	-8 5 2.591	60	2	34	120	44.0	29.0
30	29	4	79	600	84 16 50.193	-8 4 44.690	62	3	27	140	54.0	42.0
30	29	4	79	644	84 16 44.535	-8 5 14.736	64	2	26	130	36.0	40.0
30	29	4	79	724	84 16 39.921	-8 4 5.579	56	2	31	120	46.0	21.0
30	29	4	79	831	84 16 31.681	-8 4 11.951	59	2	33	130	29.0	17.0
30	29	4	79	910	84 16 27.726	-8 3 9.562	58	2	28	120	40.0	24.0
30	29	4	79	1019	84 16 15.586	-8 3 11.705	57	2	33	130	35.0	18.0
30	29	4	79	1056	84 16 15.256	-8 1 27.266	64	3	27	120	48.0	47.0
30	29	4	79	1207	84 16 0.150	-8 2 22.136	62	2	34	130	36.0	28.0
30	29	4	79	1259	84 15 54.547	-8 1 45.991	62	2	25	190	46.0	40.0
30	29	4	79	1354	84 15 47.021	-8 1 0.267	74	2	33	130	34.0	57.0
30	29	4	79	1616	84 15 32.904	-8 1 41.685	64	3	23	120	41.0	37.0
30	29	4	79	1803	84 15 21.698	-8 0 21.396	55	2	27	120	39.0	22.0
30	29	4	79	1820	84 15 19.391	-8 1 6.309	67	3	24	190	44.0	68.0
30	29	4	79	1915	84 15 11.371	-8 0 11.082	60	3	28	130	39.0	31.0
30	29	4	79	2101	84 15 0.439	-7 59 36.266	54	3	28	130	39.0	18.0
30	29	4	79	2153	84 14 54.122	-7 59 21.335	54	3	26	190	50.0	29.0
30	29	4	79	2247	84 14 48.519	-7 58 58.363	54	3	35	130	33.0	17.0
30	29	4	79	2322	84 14 45.059	-7 59 22.921	54	3	30	200	33.0	24.0
30	30	4	79	34	84 14 40.005	-7 57 54.183	60	3	29	130	37.0	35.0
30	30	4	79	108	84 14 35.281	-7 58 31.200	51	3	28	200	31.0	22.0
30	30	4	79	255	84 14 27.480	-7 57 22.799	53	3	26	200	45.0	35.0
30	30	4	79	441	84 14 18.582	-7 56 3.128	64	3	25	200	40.0	42.0
30	30	4	79	554	84 14 15.011	-7 58 31.292	73	3	32	130	31.0	48.0
30	30	4	79	647	84 14 7.980	-7 57 26.065	62	3	26	190	42.0	51.0
30	30	4	79	742	84 14 3.530	-7 56 57.098	61	3	27	130	40.0	35.0
706	30	4	79	826	84 13 51.000	-7 57 0.780	54	4	0	0	0.0	0.0
30	30	4	79	834	84 13 55.730	-7 56 56.288	54	3	31	190	44.0	27.0
706	30	4	79	922	84 13 43.800	-7 56 59.580	0	0	0	0	0.0	0.0
30	30	4	79	929	84 13 49.468	-7 56 46.328	57	3	34	130	38.0	19.0
30	30	4	79	958	84 13 44.304	-7 57 27.736	62	3	29	200	34.0	36.0
30	30	4	79	1022	84 13 41.832	-7 56 45.583	53	3	31	190	41.0	23.0
30	30	4	79	1117	84 13 34.087	-7 56 43.273	59	3	35	130	34.0	21.0
30	30	4	79	1142	84 13 30.626	-7 57 19.915	54	3	30	200	44.0	25.0
30	30	4	79	1210	84 13 28.099	-7 56 26.577	58	3	30	190	46.0	35.0



## FRAM 1

## NAVIGATION

SN	DI	MM	YY	GMT	LATITUDE	LONGITUDE	EL	I	DP	SAT	STDY	STDX
30	30	4	79	1305	84 13 20.354	-7 56 2.173	68	3	27	130	43.0	60.0
30	30	4	79	1327	84 13 20.903	-7 56 41.724	51	3	28	200	35.0	19.0
30	30	4	79	1358	84 13 15.685	-7 55 43.088	70	3	30	190	30.0	48.0
106	30	4	79	1506	84 13 8.040	-7 56 8.100	56	3	0	0	0.0	0.0
30	30	4	79	1512	84 13 12.664	-7 55 52.056	56	3	24	200	51.0	44.0
30	30	4	79	1639	84 13 2.446	-7 58 25.016	79	3	28	130	36.0	21.0
30	30	4	79	1826	84 12 54.097	-7 56 54.362	64	3	32	130	33.0	36.0
30	30	4	79	2012	84 12 46.791	-7 56 55.354	55	3	33	130	30.0	18.0
30	30	4	79	2042	84 12 47.560	-7 56 23.817	54	3	23	120	48.0	26.0
30	30	4	79	2104	84 12 46.296	-7 57 0.387	54	3	29	190	39.0	22.0
22	30	4	79	2158	84 12 39.650	-7 57 3.779	53	3	29	130	34.0	17.0
30	30	4	79	2214	84 12 43.989	-7 57 55.934	59	3	26	200	33.0	36.0
30	30	4	79	2229	84 12 42.067	-7 56 22.841	62	3	29	120	37.0	33.0
22	30	4	79	2251	84 12 36.573	-7 57 25.738	55	3	29	190	49.0	33.0
30	30	4	79	2344	84 12 39.924	-7 56 54.197	57	3	35	130	34.0	24.0
22	1	5	79	0	84 12 36.464	-7 57 22.116	52	3	21	200	38.0	26.0
22	1	5	79	16	84 12 34.706	-7 57 7.972	76	3	20	120	53.0	82.0
30	1	5	79	149	84 12 33.552	-7 57 20.327	51	3	27	200	38.0	23.0
30	1	5	79	333	84 12 27.070	-7 56 37.004	56	3	25	200	34.0	28.0
30	1	5	79	348	84 12 27.620	-7 58 41.091	70	3	29	120	47.0	59.0
30	1	5	79	505	84 12 23.335	-7 59 51.492	79	3	35	130	29.0	71.0
30	1	5	79	519	84 12 19.105	-7 55 43.167	70	4	20	200	55.0	68.0
30	1	5	79	534	84 12 18.940	-7 57 21.687	59	3	26	120	56.0	34.0
30	1	5	79	558	84 12 19.160	-7 58 4.448	67	4	31	190	37.0	50.0
30	1	5	79	652	84 12 13.887	-7 57 51.014	65	3	35	130	32.0	30.0
30	1	5	79	720	84 12 8.943	-7 56 57.757	56	3	25	120	37.0	16.0
30	1	5	79	745	84 12 6.636	-7 57 13.461	56	3	28	190	49.0	31.0
30	1	5	79	840	84 11 59.275	-7 56 57.589	58	3	28	130	37.0	22.0
30	1	5	79	906	84 11 58.341	-7 56 6.980	58	3	33	120	34.0	21.0
30	1	5	79	933	84 11 51.090	-7 56 34.727	52	3	32	190	39.0	22.0
30	1	5	79	1028	84 11 43.619	-7 56 11.210	57	3	24	130	40.0	22.0
30	1	5	79	1052	84 11 44.718	-7 54 40.243	67	3	32	120	47.0	58.0
30	1	5	79	1121	84 11 33.018	-7 55 43.030	55	3	27	190	42.0	28.0
30	1	5	79	1216	84 11 25.437	-7 55 7.496	63	3	23	130	47.0	41.0
30	1	5	79	1611	84 10 54.895	-7 52 12.504	63	3	34	120	29.0	34.0
30	1	5	79	1758	84 10 38.086	-7 49 5.050	55	3	31	120	35.0	22.0
30	1	5	79	1946	84 10 20.837	-7 46 32.958	53	3	35	120	34.0	19.0
30	1	5	79	2133	84 10 3.973	-7 44 36.905	57	3	28	120	36.0	26.0
30	1	5	79	2253	84 9 53.152	-7 43 42.914	55	3	30	200	33.0	25.0
22	1	5	79	2320	84 9 51.888	-7 40 37.289	68	2	29	120	33.0	47.0
30	2	5	79	39	84 9 33.926	-7 41 18.025	50	3	29	200	44.0	26.0
22	2	5	79	236	84 9 20.687	-7 38 24.235	52	2	25	200	38.0	24.0
30	2	5	79	412	84 8 56.847	-7 36 3.064	61	3	26	200	29.0	31.0
30	2	5	79	439	84 8 56.902	-7 36 54.823	63	3	29	120	38.0	30.0
22	2	5	79	558	84 8 41.246	-7 29 48.437	77	3	20	200	46.0	85.0
30	2	5	79	625	84 8 38.390	-7 33 50.579	56	3	32	120	39.0	18.0
30	2	5	79	656	84 8 29.601	-7 33 10.812	60	3	24	190	36.0	33.0
22	2	5	79	811	84 8 28.337	-7 30 41.051	56	3	26	120	40.0	21.0
30	2	5	79	928	84 7 59.498	-7 30 8.422	64	3	26	200	32.0	42.0
30	2	5	79	956	84 7 59.333	-7 27 15.181	62	3	31	120	50.0	42.0
30	2	5	79	1032	84 7 43.074	-7 27 30.984	52	3	27	190	37.0	25.0
30	2	5	79	1114	84 7 37.855	-7 27 14.233	54	3	29	200	36.0	23.0
22	2	5	79	1219	84 7 24.122	-7 24 5.996	59	3	29	190	37.0	36.0
30	2	5	79	1258	84 7 14.894	-7 24 15.733	51	3	29	200	38.0	19.0
30	2	5	79	1314	84 7 4.072	-7 23 43.368	70	3	28	130	40.0	44.0
30	2	5	79	1443	84 6 50.229	-7 21 34.770	54	3	31	200	33.0	21.0
30	2	5	79	1516	84 6 41.001	-7 23 27.170	70	3	27	120	28.0	54.0
30	2	5	79	1628	84 6 28.477	-7 18 36.606	64	3	30	200	41.0	51.0
30	2	5	79	1702	84 6 17.875	-7 20 14.999	58	3	23	120	36.0	31.0
30	2	5	79	1834	84 6 0.187	-7 18 47.307	61	4	31	130	45.0	37.0
30	2	5	79	1850	84 5 57.880	-7 18 25.300	53	3	27	120	37.0	23.0
30	2	5	79	1926	84 5 54.858	-7 17 52.935	51	3	25	140	45.0	25.0
30	2	5	79	2021	84 5 45.520	-7 17 41.228	54	3	26	130	43.0	22.0
30	2	5	79	2037	84 5 42.059	-7 16 58.972	45	3	28	120	40.0	25.0
30	2	5	79	2112	84 5 41.125	-7 16 11.706	54	3	26	140	47.0	31.0
30	2	5	79	2145	84 5 35.907	-7 17 21.291	61	3	32	200	32.0	33.0
30	2	5	79	2207	84 5 33.325	-7 16 17.282	53	3	27	130	42.0	24.0
22	2	5	79	2224	84 5 34.094	-7 14 46.106	62	3	31	120	36.0	37.0

## FRAM 1

## NAVIGATION

SN	DY	MM	YR	GMT	LATITUDE		LONGITUDE		EL	I	DP	SAT	STDY	STDZ
30	2	5	79	2258	84	5	27.173	-7 14	32.950	64	3	28 140	32.0	38.0
22	2	5	79	2331	84	5	26.404	-7 16	18.676	52	3	26 200	29.0	19.0
30	2	5	79	2353	84	5	18.054	-7 14	56.766	57	3	28 130	38.0	33.0
30	3	5	79	11	84	5	11.407	-7 14	17.891	76	3	34 120	28.0	72.0
22	3	5	79	118	84	5	7.178	-7 14	46.037	50	3	31 200	31.0	18.0
30	3	5	79	140	84	5	2.179	-7 12	29.055	69	3	28 130	40.0	71.0
30	3	5	79	304	84	4	42.239	-7 13	49.698	54	3	29 200	27.0	20.0
30	3	5	79	344	84	4	36.086	-7 15	6.067	68	3	24 120	52.0	71.0
22	3	5	79	450	84	4	23.068	-7 12	5.204	66	3	27 200	25.0	35.0
30	3	5	79	513	84	4	19.277	-7 16	36.882	75	4	29 130	33.0	64.0
30	3	5	79	530	84	4	10.543	-7 14	4.557	58	3	32 120	47.0	28.0
30	3	5	79	701	84	3	53.295	-7 15	17.163	63	3	36 130	37.0	31.0
22	3	5	79	716	84	3	56.426	-7 14	21.647	55	3	24 120	38.0	17.0
22	3	5	79	754	84	3	48.296	-7 14	27.405	58	3	26 140	49.0	26.0
30	3	5	79	849	84	3	26.873	-7 15	18.587	56	3	30 130	39.0	21.0
22	3	5	79	941	84	3	21.599	-7 14	8.982	64	3	20 140	57.0	55.0
30	3	5	79	1006	84	3	5.614	-7 16	8.651	59	3	30 200	33.0	30.0
30	3	5	79	1036	84	2	59.956	-7 15	34.415	57	3	30 130	38.0	24.0
30	3	5	79	1130	84	2	45.509	-7 15	47.330	55	4	26 190	42.0	31.0
30	3	5	79	1152	84	2	40.730	-7 16	25.419	51	3	31 200	39.0	22.0
30	3	5	79	1224	84	2	31.007	-7 15	48.886	64	3	35 130	30.0	27.0
22	3	5	79	1336	84	2	22.987	-7 16	11.476	50	3	29 200	34.0	19.0
30	3	5	79	1521	84	1	48.765	-7 16	10.714	57	3	28 200	37.0	31.0
30	3	5	79	1706	84	1	24.210	-7 14	38.453	70	4	29 200	38.0	65.0
30	3	5	79	1745	84	1	10.642	-7 16	2.716	66	3	27 130	38.0	47.0
30	3	5	79	1932	84	0	53.394	-7 17	44.277	56	3	33 130	34.0	23.0
30	3	5	79	2118	84	0	44.110	-7 17	2.535	52	3	32 130	35.0	19.0
22	3	5	79	2128	84	0	48.724	-7 15	48.505	57	3	31 120	26.0	23.0
22	3	5	79	2304	84	0	45.428	-7 15	35.658	54	3	32 130	40.0	25.0
22	4	5	79	50	84	0	37.299	-7 13	23.351	63	3	24 130	41.0	42.0
30	4	5	79	612	84	0	6.866	-7 15	24.561	67	2	32 130	35.0	37.0
30	4	5	79	759	84	0	1.099	-7 14	22.619	58	2	29 130	32.0	19.0
30	4	5	79	947	83	59	51.815	-7 13	28.621	56	3	29 130	33.0	19.0
30	4	5	79	1041	83	59	46.816	-7 13	4.826	52	2	21 190	49.0	34.0
22	4	5	79	1135	83	59	52.604	-7 11	7.794	60	3	25 130	40.0	40.0
30	4	5	79	1230	83	59	38.467	-7 11	34.315	50	2	24 200	41.0	24.0
22	4	5	79	1322	83	59	39.950	-7 7	54.767	72	4	22 130	29.0	47.0
22	4	5	79	1511	83	59	27.206	-7 11	27.442	69	3	20 120	35.0	66.0
22	4	5	79	1559	83	59	24.899	-7 5	10.408	61	3	23 200	55.0	73.0
30	4	5	79	1656	83	59	4.904	-7 7	14.269	72	3	25 130	32.0	69.0
30	4	5	79	1843	83	58	50.676	-7 4	54.444	59	3	31 130	37.0	34.0
22	4	5	79	1929	83	58	57.323	-7 3	36.266	50	3	22 140	55.0	39.0
30	4	5	79	2029	83	58	37.163	-7 3	16.885	53	3	31 130	32.0	17.0
22	4	5	79	2115	83	58	42.711	-7 1	0.792	54	3	32 140	41.0	32.0
30	4	5	79	2215	83	58	22.881	-7 1	27.685	52	3	22 130	39.0	19.0
30	5	5	79	2	83	58	6.676	-6 59	36.954	59	3	33 130	26.0	22.0
30	5	5	79	148	83	57	47.450	-6 57	3.096	71	3	26 130	36.0	67.0
30	5	5	79	421	83	57	7.460	-6 58	17.655	62	3	25 200	35.0	41.0
22	5	5	79	710	83	56	44.388	-6 59	34.612	61	3	30 130	30.0	22.0
30	5	5	79	938	83	56	1.487	-6 58	29.257	60	3	29 200	36.0	37.0
30	5	5	79	952	83	55	58.960	-6 58	31.938	50	3	24 190	55.0	31.0
30	5	5	79	1122	83	55	40.448	-6 58	58.621	51	3	24 200	39.0	25.0
30	5	5	79	1139	83	55	36.603	-6 59	11.307	55	3	32 190	39.0	31.0
30	5	5	79	1307	83	55	18.091	-6 59	32.957	49	3	29 200	34.0	20.0
30	5	5	79	1452	83	54	53.042	-6 59	11.025	54	3	29 200	41.0	31.0
30	5	5	79	1637	83	54	24.368	-6 58	14.370	66	3	26 200	51.0	70.0
22	5	5	79	1651	83	54	27.554	-7 0	26.711	55	3	20 140	49.0	27.0
30	5	5	79	1750	83	54	4.208	-6 59	43.311	53	3	23 120	43.0	28.0
22	5	5	79	1837	83	54	0.692	-6 59	12.138	50	3	24 140	39.0	19.0
22	5	5	79	1937	83	53	41.741	-6 58	28.000	52	3	29 120	37.0	25.0
30	5	5	79	2023	83	53	23.998	-6 57	54.512	51	3	25 140	44.0	27.0
22	5	5	79	2124	83	53	12.462	-6 56	50.005	57	3	29 120	31.0	23.0
30	5	5	79	2154	83	52	59.333	-6 58	13.546	57	3	31 200	28.0	26.0
30	5	5	79	2209	83	52	56.971	-6 56	20.431	59	3	30 140	40.0	43.0
30	5	5	79	2313	83	52	41.151	-6 56	11.608	55	3	26 130	37.0	27.0
22	5	5	79	2340	83	52	39.338	-6 57	15.555	49	3	30 200	35.0	22.0
30	6	5	79	127	83	51	57.810	-6 55	57.838	48	3	30 200	30.0	19.0
30	6	5	79	313	83	51	23.862	-6 55	31.429	55	3	30 200	34.0	29.0

## FRAM 1

## NAVIGATION

SN	DY	MN	YR	GAT	LATITUDE			LONGITUDE		EL	I	DP	SAT	STDY	STDX	
30	6	5	79	330	83	51	24.576	-6	56	51.863	70	3	28	140	49.0	65.0
30	6	5	79	459	83	50	47.662	-6	55	41.897	68	3	31	200	25.0	44.0
30	6	5	79	517	83	50	45.850	-6	55	47.964	60	3	30	140	45.0	28.0
30	6	5	79	616	83	50	23.218	-6	54	52.716	54	3	31	120	45.0	23.0
30	6	5	79	704	83	50	4.431	-6	54	59.215	57	3	28	140	49.0	22.0
30	6	5	79	802	83	49	48.226	-6	54	12.777	54	3	28	120	43.0	22.0
22	6	5	79	830	83	49	43.667	-6	56	27.092	69	4	30	200	28.0	47.0
30	6	5	79	852	83	49	25.210	-6	54	4.785	60	3	26	140	53.0	43.0
30	6	5	79	948	83	49	12.960	-6	52	40.506	62	3	33	120	43.0	37.0
30	6	5	79	1016	83	48	55.272	-6	53	18.076	55	3	28	200	31.0	26.0
30	6	5	79	1200	83	48	17.205	-6	52	45.398	49	3	26	200	38.0	21.0
30	6	5	79	1345	83	47	42.103	-6	52	34.724	50	3	30	200	36.0	21.0
30	6	5	79	1507	83	47	16.835	-6	53	44.889	67	3	27	120	42.0	52.0
30	6	5	79	1600	83	46	53.434	-6	51	33.468	58	3	23	140	43.0	42.0
30	6	5	79	1654	83	46	40.195	-6	51	56.914	56	3	28	120	35.0	28.0
30	6	5	79	1746	83	46	24.485	-6	50	55.305	50	3	30	140	40.0	25.0
30	6	5	79	1841	83	46	6.577	-6	49	55.141	51	3	24	120	45.0	25.0
30	6	5	79	1932	83	45	56.140	-6	48	33.200	49	3	27	140	40.0	22.0
30	6	5	79	2028	83	45	31.036	-6	47	23.650	53	3	27	120	32.0	24.0
30	6	5	79	2046	83	45	28.400	-6	47	40.095	65	3	29	200	32.0	41.0
30	6	5	79	2118	83	45	22.797	-6	45	15.199	54	3	30	140	39.0	33.0
30	6	5	79	2216	83	44	51.595	-6	44	51.297	62	3	24	120	46.0	49.0
30	6	5	79	2233	83	44	49.893	-6	44	34.944	52	3	31	200	26.0	20.0
30	6	5	79	2304	83	44	43.026	-6	41	49.205	66	4	25	140	33.0	57.0
30	7	5	79	2	83	44	9.957	-6	43	52.012	77	4	29	120	25.0	71.0
30	7	5	79	19	83	44	6.332	-6	42	56.168	47	3	28	200	31.0	20.0
30	7	5	79	206	83	43	24.034	-6	42	37.761	49	3	29	200	24.0	16.0
22	7	5	79	237	83	43	18.651	-6	44	39.645	77	3	34	140	38.0	77.0
22	7	5	79	335	83	42	42.506	-6	42	16.979	66	3	26	120	42.0	49.0
30	7	5	79	352	83	42	41.353	-6	43	52.548	58	3	27	200	27.0	28.0
22	7	5	79	425	83	42	32.673	-6	44	23.742	63	3	30	140	33.0	30.0
30	7	5	79	521	83	42	6.394	-6	44	41.293	56	3	32	120	40.0	23.0
22	7	5	79	621	83	41	55.375	-6	45	31.624	56	3	32	140	34.0	21.0
22	7	5	79	707	83	41	35.160	-6	46	0.882	53	3	29	120	39.0	19.0
30	7	5	79	800	83	41	21.207	-6	46	44.377	57	3	27	140	50.0	26.0
30	7	5	79	852	83	41	7.749	-6	46	55.243	57	3	28	120	45.0	27.0
30	7	5	79	908	83	41	2.311	-6	47	22.764	62	4	22	200	31.0	37.0
30	7	5	79	948	83	40	50.995	-6	47	32.137	65	3	26	140	46.0	41.0
30	7	5	79	1038	83	40	40.942	-6	47	11.421	67	4	30	120	39.0	49.0
30	7	5	79	1148	83	40	21.497	-6	48	54.884	55	3	22	190	51.0	29.0
30	7	5	79	1508	83	39	22.885	-6	49	12.548	63	3	29	140	46.0	55.0
30	7	5	79	1558	83	39	13.821	-6	49	59.374	60	3	29	120	29.0	24.0
30	7	5	79	1654	83	38	54.650	-6	49	17.712	52	4	35	140	45.0	32.0
30	7	5	79	1710	83	38	52.617	-6	49	13.953	69	4	21	190	43.0	59.0
30	7	5	79	1745	83	38	44.762	-6	49	58.145	52	3	30	120	34.0	19.0
30	7	5	79	1840	83	38	27.404	-6	49	51.739	48	3	34	140	39.0	21.0
30	7	5	79	1856	83	38	24.547	-6	49	51.460	56	3	25	190	39.0	26.0
30	7	5	79	1932	83	38	17.021	-6	50	11.847	51	3	31	120	34.0	19.0
30	7	5	79	1949	83	38	13.066	-6	49	58.207	52	3	23	130	38.0	19.0
30	7	5	79	2026	83	38	7.189	-6	50	0.950	51	3	25	140	50.0	39.0
30	7	5	79	2042	83	38	2.739	-6	50	20.739	50	3	24	190	47.0	23.0
30	7	5	79	2120	83	37	56.093	-6	50	45.867	56	3	26	120	38.0	23.0
30	7	5	79	2135	83	37	53.840	-6	50	58.405	50	3	19	130	42.0	30.0
30	7	5	79	2321	83	37	40.986	-6	50	39.237	55	3	20	130	39.0	37.0
30	8	5	79	15	83	37	34.340	-6	50	35.197	60	4	25	190	55.0	52.0
30	8	5	79	108	83	37	29.286	-6	50	30.994	66	4	23	130	34.0	58.0
30	8	5	79	332	83	37	7.917	-6	51	38.224	68	4	28	140	39.0	45.0
30	8	5	79	426	83	36	51.383	-6	50	45.455	60	4	26	120	38.0	31.0
22	8	5	79	520	83	36	39.957	-6	50	32.707	58	3	28	140	43.0	31.0
30	8	5	79	536	83	36	36.002	-6	51	20.319	63	3	24	190	33.0	46.0
30	8	5	79	612	83	36	26.774	-6	50	14.680	53	3	27	120	36.0	16.0
30	8	5	79	629	83	36	23.258	-6	50	55.950	62	4	32	130	28.0	28.0
22	8	5	79	707	83	36	8.207	-6	49	59.134	55	2	36	140	45.0	24.0
30	8	5	79	723	83	36	5.735	-6	50	18.981	52	3	22	190	44.0	38.0
22	8	5	79	757	83	35	56.561	-6	49	34.404	54	3	29	120	40.0	30.0
30	8	5	79	816	83	35	50.629	-6	49	55.779	54	3	31	130	34.0	19.0
30	8	5	79	855	83	35	36.566	-6	49	32.760	60	3	36	140	34.0	25.0
30	8	5	79	911	83	35	35.083	-6	49	29.653	48	3	21	190	42.0	26.0



## FRAM 1

## NAVIGATION

SR	DT	MO	YR	GMT	LATITUDE		LONGITUDE		EL	I	DP	SAT	STDY	STDZ		
30	8	5	79	1004	83	35	18.439	-6	49	5.356	54	3	36	130	38.0	21.0
30	8	5	79	1043	83	35	7.727	-6	49	2.970	72	4	29	140	48.0	57.0
30	8	5	79	1059	83	35	4.156	-6	48	42.034	51	3	29	190	38.0	25.0
30	8	5	79	1152	83	34	49.270	-6	48	9.511	61	4	31	130	40.0	33.0
30	8	5	79	1247	83	34	34.054	-6	47	29.819	62	4	26	190	30.0	29.0
30	8	5	79	1340	83	34	13.070	-6	47	34.760	75	4	30	130	45.0	72.0
22	8	5	79	1416	83	34	0.326	-6	44	20.339	70	3	28	140	50.0	78.0
30	8	5	79	1501	83	33	53.130	-6	44	34.756	54	3	23	200	39.0	27.0
30	8	5	79	1603	83	33	21.984	-6	44	7.870	56	3	31	140	48.0	45.0
30	8	5	79	1646	83	33	11.437	-6	41	33.828	69	4	24	200	32.0	62.0
30	8	5	79	1714	83	32	51.112	-6	42	57.578	66	4	30	130	34.0	44.0
22	8	5	79	1749	83	32	38.203	-6	43	1.118	49	3	33	140	42.0	27.0
30	8	5	79	1808	83	32	28.645	-6	42	41.267	60	4	30	190	53.0	49.0
30	8	5	79	1900	83	32	5.244	-6	42	28.464	54	3	30	130	32.0	24.0
22	8	5	79	1934	83	31	52.994	-6	41	56.058	48	3	30	140	44.0	28.0
30	8	5	79	1954	83	31	43.381	-6	41	42.706	51	3	28	190	43.0	23.0
30	8	5	79	2017	83	31	35.581	-6	43	18.528	67	4	23	200	28.0	46.0
30	8	5	79	2046	83	31	21.299	-6	41	4.429	50	3	20	130	44.0	25.0
30	8	5	79	2120	83	31	8.390	-6	40	25.744	54	4	22	140	44.0	39.0
30	8	5	79	2140	83	30	58.447	-6	40	37.286	49	3	23	190	32.0	18.0
22	8	5	79	2204	83	30	47.900	-6	40	51.610	53	3	28	200	29.0	28.0
30	8	5	79	2232	83	30	36.639	-6	39	47.906	52	3	17	130	50.0	35.0
30	8	5	79	2307	83	30	24.884	-6	37	56.321	67	4	25	140	39.0	71.0
30	8	5	79	2326	83	30	16.045	-6	39	2.268	55	4	30	190	39.0	28.0
30	8	5	79	2350	83	30	2.582	-6	39	42.410	46	3	28	200	29.0	18.0
30	9	5	79	113	83	29	32.644	-6	37	15.210	68	4	31	190	48.0	72.0
30	9	5	79	136	83	29	17.373	-6	39	1.039	47	3	26	200	21.0	12.0
22	9	5	79	240	83	28	55.016	-6	40	43.459	75	3	27	140	53.0	86.0
30	9	5	79	322	83	28	28.539	-6	39	40.154	55	3	23	200	28.0	26.0
30	9	5	79	428	83	28	9.423	-6	40	44.513	61	4	30	140	39.0	33.0
30	9	5	79	446	83	28	0.139	-6	42	0.765	70	4	33	190	33.0	57.0
30	9	5	79	509	83	27	46.626	-6	40	52.166	71	4	26	200	32.0	55.0
30	9	5	79	539	83	27	43.983	-6	42	15.033	66	4	26	130	33.0	46.0
22	9	5	79	615	83	27	27.675	-6	41	21.211	55	3	34	140	43.0	24.0
30	9	5	79	634	83	27	22.950	-6	42	9.705	55	4	31	190	29.0	25.0
22	9	5	79	727	83	27	16.194	-6	42	50.135	56	3	21	130	61.0	62.0
30	9	5	79	803	83	26	52.189	-6	42	6.965	56	3	35	140	41.0	23.0
30	9	5	79	840	83	26	39.170	-6	42	2.475	64	4	27	200	31.0	36.0
30	9	5	79	915	83	26	30.436	-6	42	12.874	53	3	31	130	32.0	16.0
30	9	5	79	950	83	26	19.120	-6	42	17.636	65	4	32	140	49.0	46.0
30	9	5	79	1024	83	26	11.375	-6	41	47.049	51	4	28	200	29.0	19.0
30	9	5	79	1103	83	26	1.487	-6	41	38.009	57	4	35	130	38.0	26.0
30	9	5	79	1210	83	25	47.974	-6	41	32.853	46	3	25	200	37.0	20.0
30	9	5	79	1250	83	25	36.548	-6	41	36.791	69	4	32	130	36.0	43.0
30	9	5	79	1354	83	25	28.693	-6	41	36.482	49	3	25	200	39.0	23.0
30	9	5	79	1511	83	25	12.158	-6	42	32.385	61	4	35	140	38.0	43.0
30	9	5	79	1539	83	25	12.048	-6	42	25.488	58	4	29	200	37.0	31.0
30	9	5	79	1554	83	25	11.444	-6	43	30.836	59	4	21	120	29.0	33.0
30	9	5	79	1657	83	25	2.545	-6	43	56.564	51	3	30	140	41.0	25.0
30	9	5	79	1741	83	25	3.754	-6	44	17.847	51	3	27	120	35.0	27.0
30	9	5	79	1811	83	25	1.172	-6	44	26.636	58	4	27	130	33.0	35.0
22	9	5	79	1843	83	25	0.238	-6	44	47.029	47	3	34	140	43.0	24.0
30	9	5	79	1905	83	25	2.985	-6	44	50.160	53	4	18	190	42.0	24.0
30	9	5	79	1928	83	25	3.534	-6	45	4.326	50	3	26	120	40.0	33.0
22	9	5	79	1957	83	25	0.128	-6	45	19.205	50	3	24	130	37.0	26.0
22	9	5	79	2029	83	24	59.799	-6	45	40.008	50	3	34	120	37.0	24.0
22	9	5	79	2052	83	25	0.732	-6	45	51.282	49	3	19	190	45.0	30.0
30	9	5	79	2055	83	25	3.259	-6	46	31.108	60	4	27	200	30.0	33.0
30	9	5	79	2116	83	25	2.490	-6	45	53.531	55	3	31	120	28.0	20.0
22	9	5	79	2144	83	24	59.359	-6	46	23.788	50	3	31	130	44.0	23.0
30	9	5	79	2215	83	25	0.293	-6	46	35.203	60	4	35	140	34.0	37.0
22	9	5	79	2238	83	24	58.810	-6	47	2.206	51	3	18	190	51.0	45.0
30	9	5	79	2242	83	25	0.847	-6	47	9.375	49	3	26	200	29.0	23.0
30	9	5	79	2302	83	24	58.370	-6	46	43.189	68	4	30	120	30.0	48.0
22	9	5	79	2330	83	24	56.558	-6	47	8.688	55	3	32	130	35.0	26.0
30	10	5	79	24	83	24	56.063	-6	46	58.182	61	4	18	190	56.0	51.0
30	10	5	79	116	83	24	48.593	-6	47	33.431	68	4	27	130	38.0	55.0
30	10	5	79	236	83	24	36.068	-6	49	29.165	72	4	33	120	34.0	57.0



## FRAM 1

## NAVIGATION

SN	DY	MM	YR	GMT	LATITUDE			LONGITUDE			EL	I	DP	SAT	STDY	STDX
30	10	5	79	336	83	24	32.058	-6	50	20.677	66	4	34	140	39.0	38.0
22	10	5	79	422	83	24	22.006	-6	49	55.072	58	3	24	120	38.0	38.0
30	10	5	79	523	83	24	18.875	-6	51	13.645	56	4	34	140	43.0	24.0
30	10	5	79	545	83	24	16.238	-6	52	2.054	60	4	25	190	40.0	37.0
30	10	5	79	607	83	24	9.316	-6	51	29.843	52	3	28	120	34.0	15.0
30	10	5	79	636	83	24	9.701	-6	52	43.383	59	4	36	130	31.0	24.0
30	10	5	79	711	83	24	4.867	-6	52	34.443	54	3	32	140	44.0	21.0
22	10	5	79	732	83	23	59.319	-6	52	51.228	50	3	19	190	31.0	24.0
22	10	5	79	753	83	23	53.936	-6	53	2.908	53	3	29	120	45.0	25.0
30	10	5	79	852	83	23	52.452	-6	53	55.896	53	3	25	130	41.0	25.0
30	10	5	79	858	83	23	48.442	-6	53	54.917	60	4	32	140	48.0	35.0
30	10	5	79	918	83	23	42.565	-6	54	42.255	58	4	25	200	28.0	30.0
30	10	5	79	938	83	23	40.972	-6	54	48.641	60	4	29	120	48.0	42.0
30	10	5	79	1013	83	23	38.719	-6	55	18.733	54	3	30	130	35.0	22.0
30	10	5	79	1102	83	23	26.195	-6	56	32.146	48	3	27	200	30.0	20.0
30	10	5	79	1201	83	23	19.823	-6	57	39.825	62	4	34	130	42.0	37.0
30	10	5	79	1247	83	23	10.758	-6	58	55.970	46	3	23	200	22.0	12.0
30	10	5	79	1432	83	22	54.994	-7	0	29.481	51	4	30	200	24.0	17.0
30	10	5	79	1458	83	22	52.577	-7	1	47.882	65	4	27	120	31.0	37.0
30	10	5	79	1617	83	22	42.250	-7	1	16.544	64	4	28	200	25.0	33.0
30	10	5	79	1645	83	22	38.459	-7	2	17.127	54	4	28	120	45.0	27.0
30	10	5	79	1722	83	22	37.086	-7	2	46.134	63	4	31	130	38.0	44.0
30	10	5	79	1832	83	22	36.372	-7	2	19.887	49	3	31	120	30.0	18.0
30	10	5	79	1908	83	22	36.812	-7	2	29.472	53	4	29	130	48.0	27.0
30	10	5	79	1948	83	22	36.812	-7	2	51.318	71	4	28	200	23.0	46.0
30	10	5	79	2020	83	22	35.219	-7	2	11.795	52	3	22	120	41.0	28.0
30	10	5	79	2054	83	22	36.921	-7	2	16.038	49	3	26	130	43.0	21.0
30	10	5	79	2134	83	22	37.471	-7	2	25.754	55	4	28	200	22.0	19.0
30	10	5	79	2207	83	22	36.097	-7	1	54.381	61	4	35	120	28.0	28.0
30	10	5	79	2241	83	22	36.537	-7	2	3.239	52	3	29	130	35.0	25.0
30	10	5	79	2320	83	22	36.152	-7	2	28.000	47	3	30	200	23.0	14.0
30	10	5	79	2354	83	22	34.779	-7	1	19.150	77	4	31	120	22.0	62.0
30	11	5	79	27	83	22	36.317	-7	1	52.414	61	4	34	130	36.0	38.0
30	11	5	79	107	83	22	35.328	-7	2	16.986	46	3	29	200	24.0	16.0
30	11	5	79	253	83	22	34.614	-7	2	12.663	52	4	29	200	23.0	18.0
30	11	5	79	326	83	22	35.164	-7	3	3.005	64	4	31	120	34.0	35.0
30	11	5	79	440	83	22	32.527	-7	2	6.260	67	4	24	200	23.0	31.0
30	11	5	79	512	83	22	32.966	-7	2	47.892	54	4	29	120	37.0	21.0
30	11	5	79	548	83	22	33.571	-7	3	17.132	64	4	29	130	30.0	33.0
30	11	5	79	658	83	22	30.769	-7	2	36.809	51	3	21	120	46.0	21.0
30	11	5	79	736	83	22	29.121	-7	2	56.588	55	3	34	130	33.0	20.0
30	11	5	79	810	83	22	24.891	-7	3	15.838	67	4	17	200	30.0	61.0
30	11	5	79	844	83	22	24.067	-7	2	27.447	56	4	33	120	35.0	23.0
30	11	5	79	924	83	22	20.057	-7	2	32.212	53	3	31	130	36.0	20.0
30	11	5	79	1029	83	22	17.860	-7	1	41.891	67	4	34	120	37.0	45.0
30	11	5	79	1112	83	22	13.960	-7	1	57.471	58	4	27	130	39.0	32.0
30	11	5	79	1259	83	22	10.498	-7	1	25.000	71	4	32	130	40.0	54.0
30	11	5	79	1325	83	22	10.609	-7	1	51.494	47	3	27	200	28.0	17.0
30	11	5	79	1402	83	22	9.346	-7	2	34.015	74	4	22	120	41.0	73.0
30	11	5	79	1510	83	22	7.533	-7	0	56.940	55	4	29	200	33.0	27.0
30	11	5	79	1549	83	22	4.402	-7	1	15.994	58	4	30	120	35.0	26.0
30	11	5	79	1655	83	22	1.490	-6	59	23.361	72	4	25	200	27.0	54.0
30	11	5	79	1736	83	21	55.942	-7	0	28.633	50	3	32	120	29.0	17.0
30	11	5	79	1820	83	21	52.976	-7	0	10.410	56	4	33	130	37.0	29.0
30	11	5	79	1924	83	21	44.736	-6	59	26.914	49	3	22	120	38.0	27.0
30	11	5	79	2006	83	21	42.155	-6	59	9.412	44	3	34	130	34.0	18.0
30	11	5	79	2026	83	21	39.792	-6	59	17.037	63	4	28	200	30.0	33.0
30	11	5	79	2111	83	21	32.487	-6	58	5.567	55	4	32	120	28.0	22.0
30	11	5	79	2152	83	21	32.432	-6	57	38.644	50	3	30	130	42.0	19.0
30	11	5	79	2212	83	21	28.367	-6	57	44.188	50	4	27	200	27.0	22.0
30	11	5	79	2258	83	21	24.467	-6	56	39.197	69	4	30	120	28.0	44.0
30	11	5	79	2338	83	21	24.576	-6	56	9.174	57	4	33	130	36.0	31.0
30	11	5	79	2359	83	21	20.786	-6	56	23.096	45	3	29	200	24.0	15.0
30	12	5	79	124	83	21	18.094	-6	54	34.812	71	4	23	130	37.0	59.0
30	12	5	79	146	83	21	15.897	-6	55	18.555	47	3	28	200	26.0	17.0
30	12	5	79	231	83	21	15.018	-6	55	43.603	71	4	35	120	32.0	51.0
30	12	5	79	332	83	21	9.580	-6	54	12.317	56	4	29	200	22.0	22.0
30	12	5	79	417	83	21	9.305	-6	54	29.700	58	4	33	120	32.0	23.0

## FRAM 1

## NAVIGATION

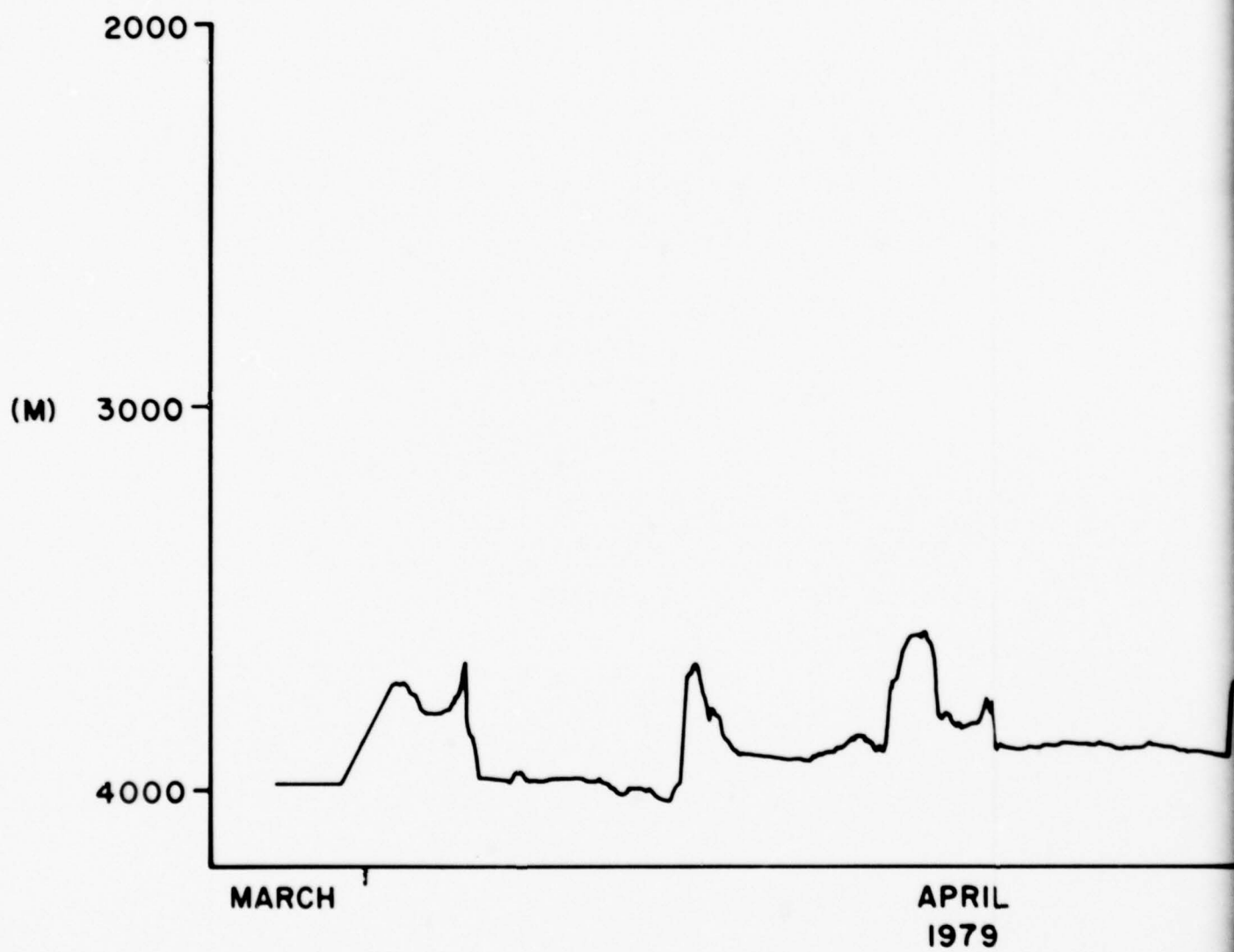
SN	DT	HN	YR	GRT	LATITUDE			LONGITUDE			EL	I	DP	SAT	STDY	STDY
30	12	5	79	458	83	21	0.888	-6	54	31.265	70	4	35	130	34.0	47.0
30	12	5	79	518	83	21	3.208	-6	52	57.813	74	4	26	200	24.0	50.0
30	12	5	79	603	83	21	1.780	-6	53	35.355	52	3	33	120	37.0	18.0
30	12	5	79	646	83	20	58.429	-6	53	25.502	57	4	31	130	34.0	26.0
30	12	5	79	748	83	20	53.375	-6	52	54.840	53	3	22	120	51.0	27.0
30	12	5	79	834	83	20	49.365	-6	52	46.868	53	3	30	130	43.0	22.0
30	12	5	79	849	83	20	48.761	-6	53	1.788	60	4	20	200	35.0	32.0
30	12	5	79	934	83	20	45.630	-6	52	7.715	61	4	33	120	36.0	31.0
30	12	5	79	1022	83	20	42.389	-6	52	18.327	55	4	25	130	51.0	30.0
30	12	5	79	1049	83	20	40.796	-6	51	48.345	75	4	27	140	52.0	70.0
30	12	5	79	1118	83	20	39.752	-6	52	0.087	52	4	27	190	27.0	21.0
30	12	5	79	1210	83	20	39.148	-6	51	41.066	64	4	27	130	38.0	45.0
30	12	5	79	1422	83	20	37.830	-6	52	7.416	66	4	31	140	44.0	66.0
30	12	5	79	1609	83	20	37.830	-6	51	57.299	53	4	34	140	40.0	30.0
30	12	5	79	1639	83	20	35.522	-6	52	11.478	70	4	28	190	45.0	73.0
30	12	5	79	1731	83	20	37.830	-6	52	27.360	61	4	13	130	56.0	60.0
30	12	5	79	1754	83	20	34.973	-6	51	50.467	47	3	31	140	46.0	24.0
30	12	5	79	1826	83	20	32.341	-6	52	2.953	55	4	22	190	44.0	27.0
30	12	5	79	1940	83	20	28.931	-6	52	4.402	48	3	31	140	37.0	22.0
30	12	5	79	2011	83	20	26.624	-6	52	38.855	49	3	23	190	42.0	22.0
30	12	5	79	2126	83	20	22.014	-6	52	31.270	55	4	32	140	42.0	38.0
30	12	5	79	2158	83	20	20.911	-6	52	51.362	49	3	25	190	38.0	24.0

### Depth Soundings

As FRAM I drifted, a continuous record of ocean depths was made with an echo sounder operating at a frequency of 12 kHz. The sounder was manufactured by the Edo Western Corp. and consisted of three units: Model D-100 transducer, Model 248E sonar transceiver and Model 550A graphic recorder. The instrument was installed in the Lamont current meter shelter with the transducer suspended through an open hydrographic well at a depth of 2 m below sea level. The equipment operated well throughout the expedition. Depths for this report were scaled at hourly intervals from the chart records on which 19" represented a depth change of 1500 m. The actual physical measurement is two-way reflection time from the transducer to the bottom and return. The uncorrected depth is defined as the reflection time multiplied by the nominal speed of sound in seawater, 1500 m/s. More precise depth determination requires a correction for the sound speed profile in particular geographic areas of the ocean. The corrected depths listed here are based on tables by Matthews (1939).

At the outset, FRAM I was located over the southernmost extension of the Pole Abyssal Plain which separates the Arctic Mid-Oceanic Ridge from the Lomonosov Ridge. The camp drifted southward and it moved over the Mid-Oceanic Ridge which trends northeast-southwest in this region. Depths generally decreased over the course of the drift as the crest of the Ridge was approached. The characteristic rough topography of the flank is shown in the profile which ends just short of the Ridge crest.

BATHYMETRIC PROFILE ALONG THE DRIFT TRACK OF FRAM I



1



A line graph on a white background. The graph starts with a baseline that has small, low-amplitude fluctuations. It then shows a series of peaks that increase in amplitude from left to right. The first peak is small, followed by a slightly larger one, then a much larger one, and finally a very sharp, tall peak. After the tall peak, the signal drops slightly and then rises again to a high, noisy level, fluctuating between two different high amplitudes.

**MAY**

OCEAN DEPTHS AT FRAM I

Key to column headings:

DY = Day

MN = Month

YR = Year

GMT = Greenwich Mean Time

SECONDS = Two-way reflection time

METERS = Uncorrected depth based on sound speed of  
(UNCORR)  $1500 \text{ m s}^{-1}$

VEL = Depth correction for sound speed in Arctic  
(CORR) waters (Matthews, 1939)

METERS = Corrected depths = METERS (UNCORR) + VEL (CORR)  
(CORR)

## FRAM 1 DEPTH DATA

DT	MM	YR	GAT	SECONDS	METERS (UNCORR)	VEL CURR	METERS (CORR)
26	3	79	1500	5.386	4039.5	-58	3981.5
26	3	79	1600	5.387	4040.3	-58	3982.3
26	3	79	1700	5.389	4041.8	-58	3983.8
26	3	79	1800	5.387	4040.3	-58	3982.3
26	3	79	1900	5.387	4040.3	-58	3982.3
26	3	79	2000	5.387	4040.3	-58	3982.3
26	3	79	2100	5.388	4041.0	-58	3983.0
26	3	79	2200	5.389	4041.8	-58	3983.8
26	3	79	2300	5.387	4040.3	-58	3982.3
27	3	79	0	5.387	4040.3	-58	3982.3
27	3	79	100	5.388	4041.0	-58	3983.0
27	3	79	200	5.388	4041.0	-58	3983.0
27	3	79	300	5.388	4041.0	-58	3983.0
27	3	79	400	5.387	4040.3	-58	3982.3
27	3	79	500	5.386	4039.5	-58	3981.5
27	3	79	600	5.386	4039.5	-58	3981.5
27	3	79	700	5.386	4039.5	-58	3981.5
27	3	79	800	5.386	4039.5	-58	3981.5
27	3	79	900	5.385	4038.8	-58	3980.8
27	3	79	1000	5.385	4038.8	-58	3980.8
27	3	79	1100	5.387	4040.3	-58	3982.3
27	3	79	1200	5.385	4038.8	-58	3980.8
27	3	79	1300	5.385	4038.8	-58	3980.8
27	3	79	1400	5.385	4038.8	-58	3980.8
27	3	79	1500	5.386	4039.5	-58	3981.5
27	3	79	1600	5.386	4039.5	-58	3981.5
27	3	79	1700	5.385	4038.8	-58	3980.8
27	3	79	1800	5.386	4039.5	-58	3981.5
27	3	79	1900	5.385	4038.8	-58	3980.8
27	3	79	2000	5.385	4038.8	-58	3980.8
27	3	79	2100	5.385	4038.8	-58	3980.8
27	3	79	2200	5.386	4039.5	-58	3981.5
27	3	79	2300	5.386	4039.5	-58	3981.5
28	3	79	0	5.386	4039.5	-58	3981.5
28	3	79	100	5.385	4038.8	-58	3980.8
28	3	79	200	5.386	4039.5	-58	3981.5
28	3	79	300	5.386	4039.5	-58	3981.5
28	3	79	400	5.385	4038.8	-58	3980.8
28	3	79	500	5.386	4039.5	-58	3981.5
28	3	79	600	5.385	4038.8	-58	3980.8
28	3	79	700	5.385	4038.8	-58	3980.8
28	3	79	800	5.385	4038.8	-58	3980.8
28	3	79	900	5.386	4039.5	-58	3981.5
28	3	79	1000	5.385	4038.8	-58	3980.8
29	3	79	1800	5.039	3779.3	-60	3719.3
29	3	79	1900	5.033	3774.8	-60	3714.8
29	3	79	2000	5.031	3773.3	-60	3713.3
29	3	79	2100	5.031	3773.3	-60	3713.3
29	3	79	2200	5.037	3777.8	-60	3717.8
29	3	79	2300	5.039	3779.3	-60	3719.3
30	3	79	0	5.033	3774.8	-60	3714.8
30	3	79	100	5.038	3778.5	-60	3718.5
30	3	79	200	5.039	3779.3	-60	3719.3
30	3	79	300	5.044	3783.0	-60	3723.0
30	3	79	400	5.053	3789.8	-60	3729.8
30	3	79	500	5.068	3801.0	-60	3741.0
30	3	79	600	5.075	3806.3	-60	3746.3
30	3	79	700	5.078	3808.5	-60	3748.5
30	3	79	800	5.080	3810.0	-60	3750.0
30	3	79	900	5.085	3813.8	-60	3753.8
30	3	79	1000	5.100	3825.0	-60	3765.0
30	3	79	1100	5.105	3828.8	-60	3768.8
30	3	79	1200	5.132	3849.0	-59	3790.0
30	3	79	1300	5.136	3852.0	-59	3793.0
30	3	79	1400	5.142	3856.5	-59	3797.5
30	3	79	1500	5.141	3855.8	-59	3796.8
30	3	79	1600	5.141	3855.8	-59	3796.8
30	3	79	1700	5.141	3855.8	-59	3796.8

## FRAM I DEPTH DATA

DT	MN	YR	GAT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
30	3	79	1800	5.141	3855.8	-59	3796.8
30	3	79	1900	5.142	3856.5	-59	3797.5
30	3	79	2000	5.140	3855.0	-59	3796.0
30	3	79	2100	5.141	3855.8	-59	3796.8
30	3	79	2200	5.140	3855.0	-59	3796.0
30	3	79	2300	5.140	3855.0	-59	3796.0
31	3	79	0	5.139	3854.3	-59	3795.3
31	3	79	100	5.135	3851.3	-59	3792.3
31	3	79	200	5.132	3849.0	-59	3790.0
31	3	79	300	5.130	3847.5	-60	3787.5
31	3	79	400	5.129	3846.8	-60	3786.8
31	3	79	500	5.124	3843.0	-60	3783.0
31	3	79	600	5.120	3840.0	-60	3780.0
31	3	79	700	5.101	3825.8	-60	3765.8
31	3	79	800	5.097	3822.8	-60	3762.8
31	3	79	900	5.080	3810.0	-60	3750.0
31	3	79	1000	5.081	3810.8	-60	3750.8
31	3	79	1100	5.072	3804.0	-60	3744.0
31	3	79	1200	5.060	3795.0	-60	3735.0
31	3	79	1300	5.040	3780.0	-60	3720.0
31	3	79	1400	5.000	3750.0	-60	3690.0
31	3	79	1500	4.961	3720.8	-60	3660.8
31	3	79	1600	4.985	3738.8	-60	3678.8
31	3	79	1700	5.168	3876.0	-59	3817.0
31	3	79	1800	5.205	3903.8	-59	3844.8
31	3	79	1900	5.225	3918.8	-59	3859.8
31	3	79	2000	5.227	3920.3	-59	3861.3
31	3	79	2300	5.309	3981.8	-58	3923.8
1	4	79	0	5.365	4023.8	-58	3965.8
1	4	79	100	5.370	4027.5	-58	3969.5
1	4	79	200	5.370	4027.5	-58	3969.5
1	4	79	300	5.371	4028.3	-58	3970.3
1	4	79	400	5.371	4028.3	-58	3970.3
1	4	79	500	5.371	4028.3	-58	3970.3
1	4	79	600	5.371	4028.3	-58	3970.3
1	4	79	700	5.372	4029.0	-58	3971.0
1	4	79	800	5.373	4029.8	-58	3971.8
1	4	79	900	5.375	4031.3	-58	3973.3
1	4	79	1000	5.374	4030.5	-58	3972.5
1	4	79	1100	5.373	4029.8	-58	3971.8
1	4	79	1200	5.374	4030.5	-58	3972.5
1	4	79	1300	5.373	4029.8	-58	3971.8
1	4	79	1400	5.374	4030.5	-58	3972.5
1	4	79	1500	5.375	4031.3	-58	3973.3
1	4	79	1600	5.375	4031.3	-58	3973.3
1	4	79	1700	5.375	4031.3	-58	3973.3
1	4	79	1800	5.376	4032.0	-58	3974.0
1	4	79	1900	5.378	4033.5	-58	3975.5
1	4	79	2000	5.370	4027.5	-58	3969.5
1	4	79	2100	5.358	4018.5	-58	3960.5
1	4	79	2200	5.345	4008.8	-58	3950.8
1	4	79	2300	5.345	4008.8	-58	3950.8
2	4	79	0	5.341	4005.8	-58	3947.8
2	4	79	100	5.340	4005.0	-58	3947.0
2	4	79	200	5.339	4004.3	-58	3946.3
2	4	79	300	5.341	4005.8	-58	3947.8
2	4	79	400	5.346	4009.5	-58	3951.5
2	4	79	500	5.355	4016.3	-58	3958.3
2	4	79	600	5.368	4026.0	-58	3968.0
2	4	79	700	5.376	4032.0	-58	3974.0
2	4	79	800	5.377	4032.8	-58	3974.8
2	4	79	900	5.378	4033.5	-58	3975.5
2	4	79	1000	5.375	4031.3	-58	3973.3
2	4	79	1100	5.375	4031.3	-58	3973.3
2	4	79	1200	5.375	4031.3	-58	3973.3
2	4	79	1300	5.375	4031.3	-58	3973.3
2	4	79	1400	5.375	4031.3	-58	3973.3
2	4	79	1500	5.375	4031.3	-58	3973.3



## FRAM I DEPTH DATA

DY	MM	YR	GMT	SECONDS	METERS (UNCORR)	VEL CURR	METERS (CORR)
2	4	79	1600	5.374	4030.5	-58	3972.5
2	4	79	1700	5.372	4029.0	-58	3971.0
2	4	79	1800	5.371	4028.3	-58	3970.3
2	4	79	1900	5.372	4029.0	-58	3971.0
2	4	79	2000	5.372	4029.0	-58	3971.0
2	4	79	2100	5.370	4027.5	-58	3969.5
2	4	79	2200	5.370	4027.5	-58	3969.5
2	4	79	2300	5.370	4027.5	-58	3969.5
3	4	79	0	5.370	4027.5	-58	3969.5
3	4	79	100	5.370	4027.5	-58	3969.5
3	4	79	200	5.369	4026.8	-58	3968.8
3	4	79	300	5.369	4026.8	-58	3968.8
3	4	79	400	5.370	4027.5	-58	3969.5
3	4	79	500	5.370	4027.5	-58	3969.5
3	4	79	600	5.370	4027.5	-58	3969.5
3	4	79	700	5.370	4027.5	-58	3969.5
3	4	79	800	5.370	4027.5	-58	3969.5
3	4	79	900	5.370	4027.5	-58	3969.5
3	4	79	1000	5.370	4027.5	-58	3969.5
3	4	79	1100	5.370	4027.5	-58	3969.5
3	4	79	1200	5.370	4027.5	-58	3969.5
3	4	79	1300	5.370	4027.5	-58	3969.5
3	4	79	1400	5.371	4028.3	-58	3970.3
3	4	79	1500	5.371	4028.3	-58	3970.3
3	4	79	1600	5.371	4028.3	-58	3970.3
3	4	79	1700	5.374	4030.5	-58	3972.5
3	4	79	1800	5.375	4031.3	-58	3973.3
3	4	79	1900	5.375	4031.3	-58	3973.3
3	4	79	2000	5.375	4031.3	-58	3973.3
3	4	79	2100	5.375	4031.3	-58	3973.3
3	4	79	2200	5.375	4031.3	-58	3973.3
3	4	79	2300	5.375	4031.3	-58	3973.3
4	4	79	0	5.375	4031.3	-58	3973.3
4	4	79	100	5.375	4031.3	-58	3973.3
4	4	79	200	5.375	4031.3	-58	3973.3
4	4	79	300	5.370	4027.5	-58	3969.5
4	4	79	400	5.374	4030.5	-58	3972.5
4	4	79	500	5.380	4035.0	-58	3977.0
4	4	79	600	5.380	4035.0	-58	3977.0
4	4	79	700	5.385	4038.8	-58	3980.8
4	4	79	800	5.385	4038.8	-58	3980.8
4	4	79	900	5.390	4042.5	-58	3984.5
4	4	79	1000	5.396	4047.0	-58	3989.0
4	4	79	1100	5.398	4048.5	-58	3990.5
4	4	79	1200	5.400	4050.0	-58	3992.0
4	4	79	1300	5.408	4056.0	-58	3998.0
4	4	79	1400	5.416	4062.0	-58	4004.0
4	4	79	1500	5.426	4069.5	-58	4011.5
4	4	79	1600	5.426	4069.5	-58	4011.5
4	4	79	1700	5.423	4067.3	-58	4009.3
4	4	79	1800	5.420	4065.0	-58	4007.0
4	4	79	1900	5.417	4062.8	-58	4004.8
4	4	79	2000	5.414	4060.5	-58	4002.5
4	4	79	2100	5.410	4057.5	-58	3999.5
4	4	79	2200	5.400	4050.0	-58	3992.0
4	4	79	2300	5.397	4047.8	-58	3989.8
5	4	79	0	5.397	4047.8	-58	3989.8
5	4	79	100	5.395	4046.3	-58	3988.3
5	4	79	200	5.395	4046.3	-58	3988.3
5	4	79	300	5.395	4046.3	-58	3988.3
5	4	79	400	5.396	4047.0	-58	3989.0
5	4	79	500	5.397	4047.8	-58	3989.8
5	4	79	600	5.395	4046.3	-58	3988.3
5	4	79	700	5.400	4050.0	-58	3992.0
5	4	79	800	5.405	4053.8	-58	3995.8
5	4	79	900	5.409	4056.8	-58	3998.8
5	4	79	1000	5.405	4053.8	-58	3995.8
5	4	79	1100	5.403	4052.3	-58	3994.3

## FRAM 1 DEPTH DATA

LY	MR	TR	GMI	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
5	4	79	1200	5.405	4053.8	-58	3995.8
5	4	79	1300	5.414	4060.5	-58	4002.5
5	4	79	1400	5.420	4065.0	-58	4007.0
5	4	79	1500	5.432	4074.0	-58	4016.0
5	4	79	1600	5.435	4076.3	-58	4018.3
5	4	79	1700	5.440	4080.0	-58	4022.0
5	4	79	1800	5.442	4081.5	-58	4023.5
5	4	79	1900	5.443	4082.3	-58	4024.3
5	4	79	2000	5.445	4083.8	-58	4025.8
5	4	79	2100	5.446	4084.5	-58	4026.5
5	4	79	2200	5.446	4084.5	-58	4026.5
5	4	79	2300	5.445	4083.8	-58	4025.8
6	4	79	0	5.427	4070.3	-58	4012.3
6	4	79	100	5.411	4058.3	-58	4000.3
6	4	79	200	5.400	4050.0	-58	3992.0
6	4	79	300	5.390	4042.5	-58	3984.5
6	4	79	400	5.385	4038.8	-58	3980.8
6	4	79	500	5.381	4035.8	-58	3977.8
6	4	79	600	5.380	4035.0	-58	3977.0
6	4	79	700	5.289	3966.8	-58	3908.8
6	4	79	800	5.199	3899.3	-59	3840.3
6	4	79	900	5.109	3891.8	-60	3771.8
6	4	79	1000	5.015	3761.3	-60	3701.3
6	4	79	1100	5.000	3750.0	-60	3690.0
6	4	79	1200	4.999	3749.3	-60	3689.3
6	4	79	1300	5.000	3750.0	-60	3690.0
6	4	79	1400	4.970	3727.5	-60	3667.5
6	4	79	1500	4.964	3723.0	-60	3663.0
6	4	79	1600	4.976	3732.0	-60	3672.0
6	4	79	1700	4.989	3741.8	-60	3681.8
6	4	79	1800	5.012	3759.0	-60	3699.0
6	4	79	1900	5.035	3776.3	-60	3716.3
6	4	79	2000	5.058	3790.5	-60	3733.5
6	4	79	2100	5.081	3810.8	-60	3750.8
6	4	79	2200	5.092	3819.0	-60	3759.0
6	4	79	2300	5.107	3830.3	-60	3770.3
7	4	79	0	5.111	3833.3	-60	3823.3
7	4	79	100	5.120	3840.0	-60	3780.0
7	4	79	200	5.122	3841.5	-60	3781.5
7	4	79	300	5.130	3847.5	-60	3787.5
7	4	79	400	5.135	3851.3	-59	3792.3
7	4	79	500	5.140	3855.0	-59	3796.0
7	4	79	600	5.157	3867.8	-59	3808.8
7	4	79	700	5.162	3871.5	-59	3812.5
7	4	79	800	5.178	3883.5	-59	3824.5
7	4	79	900	5.201	3900.8	-59	3841.8
7	4	79	1000	5.219	3914.3	-59	3855.3
7	4	79	1100	5.229	3921.8	-59	3862.8
7	4	79	1200	5.235	3926.3	-59	3867.3
7	4	79	1300	5.240	3930.0	-59	3871.0
7	4	79	1400	5.248	3936.0	-59	3877.0
7	4	79	1500	5.259	3944.3	-59	3885.3
7	4	79	1600	5.268	3951.0	-58	3893.0
7	4	79	1700	5.275	3956.3	-58	3898.3
7	4	79	1800	5.276	3957.0	-58	3899.0
7	4	79	1900	5.283	3962.3	-58	3904.3
7	4	79	2000	5.283	3962.3	-58	3904.3
7	4	79	2100	5.282	3961.5	-58	3903.5
7	4	79	2200	5.283	3962.3	-58	3904.3
7	4	79	2300	5.285	3963.8	-58	3905.8
8	4	79	0	5.285	3963.8	-58	3905.8
8	4	79	100	5.285	3963.8	-58	3905.8
8	4	79	200	5.284	3963.0	-58	3905.0
8	4	79	300	5.285	3963.8	-58	3905.8
8	4	79	400	5.285	3963.8	-58	3905.8
8	4	79	500	5.286	3964.5	-58	3906.5
8	4	79	600	5.288	3966.0	-58	3908.0
8	4	79	700	5.287	3965.3	-58	3907.3

## FRAM 1 DEPTH DATA

DT	SH	TR	GAT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
8	4	79	800	5.288	3966.0	-58	3908.0
8	4	79	900	5.289	3966.8	-58	3908.8
8	4	79	1000	5.287	3965.3	-58	3907.3
8	4	79	1100	5.288	3966.0	-58	3908.0
8	4	79	1200	5.288	3966.0	-58	3908.0
8	4	79	1300	5.289	3966.8	-58	3908.8
8	4	79	1400	5.290	3967.5	-58	3909.5
8	4	79	1500	5.291	3968.3	-58	3910.3
8	4	79	1600	5.292	3969.0	-58	3911.0
8	4	79	1700	5.293	3969.8	-58	3911.8
8	4	79	1800	5.294	3970.5	-58	3912.5
8	4	79	1900	5.295	3971.3	-58	3913.3
8	4	79	2000	5.296	3972.0	-58	3914.0
8	4	79	2100	5.297	3972.8	-58	3914.8
8	4	79	2200	5.297	3972.8	-58	3914.8
8	4	79	2300	5.297	3972.8	-58	3914.8
8	4	79	0	5.296	3972.0	-58	3914.0
8	4	79	100	5.298	3973.5	-58	3915.5
8	4	79	200	5.298	3973.5	-58	3915.5
8	4	79	300	5.298	3973.5	-58	3915.5
8	4	79	400	5.298	3973.5	-58	3915.5
8	4	79	500	5.298	3973.5	-58	3915.5
8	4	79	600	5.298	3973.5	-58	3915.5
8	4	79	700	5.298	3973.5	-58	3915.5
8	4	79	800	5.298	3973.5	-58	3915.5
8	4	79	900	5.298	3973.5	-58	3915.5
8	4	79	1000	5.299	3974.3	-58	3916.3
8	4	79	1100	5.300	3975.0	-58	3917.0
8	4	79	1200	5.300	3975.0	-58	3917.0
8	4	79	1300	5.301	3975.8	-58	3917.8
8	4	79	1400	5.301	3975.8	-58	3917.8
8	4	79	1500	5.301	3975.8	-58	3917.8
8	4	79	1600	5.301	3975.8	-58	3917.8
8	4	79	1700	5.291	3968.3	-58	3910.3
8	4	79	1800	5.290	3967.5	-58	3909.5
8	4	79	1900	5.288	3966.0	-58	3908.0
8	4	79	2000	5.281	3960.8	-58	3902.8
8	4	79	2100	5.280	3960.0	-58	3902.0
8	4	79	2200	5.280	3960.0	-58	3902.0
8	4	79	2300	5.280	3960.0	-58	3902.0
10	4	79	0	5.275	3956.3	-58	3898.3
10	4	79	100	5.274	3955.5	-58	3897.5
10	4	79	200	5.273	3954.8	-58	3896.8
10	4	79	300	5.269	3951.8	-58	3893.8
10	4	79	400	5.269	3951.8	-58	3893.8
10	4	79	500	5.270	3952.5	-58	3894.5
10	4	79	600	5.270	3952.5	-58	3894.5
10	4	79	700	5.269	3951.8	-58	3893.8
10	4	79	800	5.261	3945.8	-59	3886.8
10	4	79	900	5.258	3943.5	-59	3884.5
10	4	79	1000	5.257	3942.8	-59	3883.8
10	4	79	1100	5.254	3940.5	-59	3881.8
10	4	79	1200	5.250	3937.5	-59	3878.5
10	4	79	1300	5.250	3937.5	-59	3878.5
10	4	79	1400	5.240	3930.0	-59	3871.0
10	4	79	1500	5.239	3929.3	-59	3870.3
10	4	79	1600	5.230	3922.5	-59	3863.5
10	4	79	1700	5.228	3921.0	-59	3862.0
10	4	79	1800	5.229	3921.8	-59	3862.8
10	4	79	1900	5.223	3917.3	-59	3858.3
10	4	79	2000	5.217	3912.8	-59	3853.8
10	4	79	2100	5.214	3910.5	-59	3851.5
10	4	79	2200	5.216	3912.0	-59	3853.0
10	4	79	2300	5.218	3913.5	-59	3854.5
11	4	79	0	5.218	3913.5	-59	3854.5
11	4	79	100	5.218	3913.5	-59	3854.5
11	4	79	200	5.229	3921.8	-59	3862.8
11	4	79	300	5.229	3921.8	-59	3862.8

## FRAM 1 DEPTH DATA

DY	MO	YR	GMT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
11	4	79	400	5.237	3927.8	-59	3868.8
11	4	79	500	5.238	3928.5	-59	3869.5
11	4	79	600	5.241	3930.8	-59	3871.8
11	4	79	700	5.250	3937.5	-59	3878.5
11	4	79	800	5.268	3951.0	-58	3893.0
11	4	79	900	5.269	3951.8	-58	3893.8
11	4	79	1000	5.272	3954.0	-58	3896.0
11	4	79	1100	5.270	3952.5	-58	3879.5
11	4	79	1200	5.270	3952.5	-58	3894.5
11	4	79	1300	5.274	3955.5	-58	3897.5
11	4	79	1400	5.264	3948.0	-59	3889.0
11	4	79	1500	5.205	3903.8	-59	3844.8
11	4	79	1600	5.135	3851.3	-59	3792.3
11	4	79	1700	5.073	3804.8	-60	3744.8
11	4	79	1800	5.038	3778.5	-60	3718.5
11	4	79	1900	5.029	3771.8	-60	3711.8
11	4	79	2000	5.029	3771.8	-60	3711.8
11	4	79	2100	5.019	3764.3	-60	3704.3
11	4	79	2200	5.000	3750.0	-60	3690.0
11	4	79	2300	4.970	3727.5	-60	3667.5
12	4	79	0	4.949	3711.8	-60	3651.8
12	4	79	100	4.926	3694.5	-60	3634.5
12	4	79	200	4.915	3686.3	-60	3626.3
12	4	79	300	4.903	3677.3	-60	3617.3
12	4	79	400	4.890	3667.5	-60	3607.5
12	4	79	500	4.880	3660.0	-60	3600.0
12	4	79	600	4.875	3656.3	-60	3596.3
12	4	79	700	4.870	3652.5	-60	3592.5
12	4	79	800	4.870	3652.5	-60	3592.5
12	4	79	900	4.866	3651.0	-60	3591.0
12	4	79	1000	4.867	3650.3	-60	3590.3
12	4	79	1100	4.865	3648.8	-61	3587.8
12	4	79	1200	4.872	3654.0	-60	3593.0
12	4	79	1300	4.878	3658.5	-60	3598.5
12	4	79	1400	4.869	3651.8	-60	3591.8
12	4	79	1500	4.859	3644.3	-61	3583.3
12	4	79	1600	4.866	3649.5	-61	3588.5
12	4	79	1700	4.888	3666.0	-60	3606.0
12	4	79	1800	4.900	3675.0	-60	3615.0
12	4	79	1900	4.910	3682.5	-60	3622.5
12	4	79	2000	4.926	3694.5	-60	3634.5
12	4	79	2100	4.958	3718.5	-60	3658.5
12	4	79	2200	5.029	3771.8	-60	3711.8
12	4	79	2300	5.101	3825.8	-60	3765.8
13	4	79	0	5.160	3870.0	-59	3811.0
13	4	79	100	5.162	3871.5	-59	3812.5
13	4	79	200	5.160	3870.0	-59	3811.0
13	4	79	300	5.150	3862.5	-59	3803.5
13	4	79	400	5.145	3858.8	-59	3799.8
13	4	79	500	5.147	3860.3	-59	3801.3
13	4	79	600	5.149	3861.8	-59	3802.8
13	4	79	700	5.154	3865.5	-59	3806.5
13	4	79	800	5.169	3876.8	-59	3817.8
13	4	79	900	5.175	3881.3	-59	3822.3
13	4	79	1000	5.181	3885.8	-59	3826.8
13	4	79	1100	5.185	3888.8	-59	3829.8
13	4	79	1200	5.181	3885.8	-59	3826.8
13	4	79	1300	5.180	3885.0	-59	3826.0
13	4	79	1400	5.190	3892.5	-59	3833.5
13	4	79	1500	5.189	3891.8	-59	3832.8
13	4	79	1600	5.188	3891.0	-59	3832.0
13	4	79	1700	5.186	3889.5	-59	3830.5
13	4	79	1800	5.184	3888.0	-59	3829.0
13	4	79	1900	5.180	3885.0	-59	3826.0
13	4	79	2000	5.180	3885.0	-59	3826.0
13	4	79	2100	5.174	3880.5	-59	3821.5
13	4	79	2200	5.174	3880.5	-59	3821.5
13	4	79	2300	5.174	3880.5	-59	3821.5



## FRAM 1 DEPTH DATA

DY	MM	YR	GAT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
14	4	79	0	5.174	3880.5	-59	3821.5
14	4	79	100	5.174	3880.5	-59	3821.5
14	4	79	200	5.168	3876.0	-59	3817.0
14	4	79	300	5.155	3866.3	-59	3807.3
14	4	79	400	5.125	3843.8	-60	3783.8
14	4	79	500	5.105	3828.8	-60	3768.8
14	4	79	600	5.084	3813.0	-60	3753.0
14	4	79	700	5.098	3823.5	-60	3763.5
14	4	79	800	5.140	3855.0	-59	3796.0
14	4	79	900	5.137	3852.8	-59	3793.8
14	4	79	1000	5.110	3832.5	-60	3772.5
14	4	79	1100	5.217	3912.8	-59	3853.8
14	4	79	1200	5.265	3948.8	-59	3889.8
14	4	79	1300	5.265	3948.8	-59	3889.8
14	4	79	1400	5.260	3945.0	-59	3886.0
14	4	79	1500	5.250	3937.5	-59	3878.5
14	4	79	1600	5.254	3940.5	-59	3881.5
14	4	79	1700	5.257	3942.8	-59	3883.8
14	4	79	1800	5.259	3944.3	-59	3885.3
14	4	79	1900	5.260	3945.0	-59	3886.0
14	4	79	2000	5.260	3945.0	-59	3886.0
14	4	79	2100	5.260	3945.0	-59	3886.0
14	4	79	2200	5.261	3945.8	-59	3886.8
14	4	79	2300	5.262	3946.5	-59	3887.5
15	4	79	0	5.264	3948.0	-59	3889.0
15	4	79	100	5.264	3948.0	-59	3889.0
15	4	79	200	5.262	3946.5	-59	3887.5
15	4	79	300	5.261	3945.8	-59	3886.8
15	4	79	400	5.262	3946.5	-59	3887.5
15	4	79	500	5.260	3945.0	-59	3886.0
15	4	79	600	5.260	3945.0	-59	3886.0
15	4	79	700	5.260	3945.0	-59	3886.0
15	4	79	800	5.258	3943.5	-59	3884.5
15	4	79	900	5.255	3941.3	-59	3882.3
15	4	79	1000	5.258	3943.5	-59	3884.5
15	4	79	1100	5.255	3941.3	-59	3882.3
15	4	79	1200	5.255	3941.3	-59	3882.3
15	4	79	1300	5.255	3941.3	-59	3882.3
15	4	79	1400	5.255	3941.3	-59	3882.3
15	4	79	1500	5.253	3939.8	-59	3880.8
15	4	79	1600	5.255	3941.3	-59	3882.3
15	4	79	1700	5.251	3938.3	-59	3879.3
15	4	79	1800	5.250	3937.5	-59	3878.5
15	4	79	1900	5.251	3938.3	-59	3879.3
15	4	79	2000	5.250	3937.5	-59	3878.5
15	4	79	2100	5.250	3937.5	-59	3878.5
15	4	79	2200	5.249	3936.8	-59	3877.8
15	4	79	2300	5.249	3936.8	-59	3877.8
16	4	79	0	5.248	3936.0	-59	3877.0
16	4	79	100	5.248	3936.0	-59	3877.0
16	4	79	200	5.250	3937.5	-59	3878.5
16	4	79	300	5.247	3935.3	-59	3876.3
16	4	79	400	5.245	3933.8	-59	3874.8
16	4	79	500	5.244	3933.0	-59	3874.0
16	4	79	600	5.246	3934.5	-59	3875.5
16	4	79	700	5.246	3934.5	-59	3875.5
16	4	79	800	5.245	3933.8	-59	3874.8
16	4	79	900	5.245	3933.8	-59	3874.8
16	4	79	1000	5.245	3933.8	-59	3874.8
16	4	79	1100	5.245	3933.8	-59	3874.8
16	4	79	1200	5.244	3933.0	-59	3874.0
16	4	79	1300	5.244	3933.0	-59	3874.0
16	4	79	1400	5.244	3933.0	-59	3874.0
16	4	79	1500	5.244	3933.0	-59	3874.0
16	4	79	1600	5.244	3933.0	-59	3874.0
16	4	79	1700	5.244	3933.0	-59	3874.0
16	4	79	1800	5.245	3933.8	-59	3874.8
16	4	79	1900	5.244	3933.0	-59	3874.0

## FRAM 1 DEPTH DATA

DT	MR	TR	GMI	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
16	4	79	2000	5.243	3932.3	-59	3873.3
16	4	79	2100	5.243	3932.3	-59	3873.3
16	4	79	2200	5.247	3935.3	-59	3876.3
16	4	79	2300	5.246	3934.5	-59	3875.5
17	4	79	0	5.246	3934.5	-59	3875.5
17	4	79	100	5.246	3934.5	-59	3875.5
17	4	79	200	5.245	3933.8	-59	3874.8
17	4	79	300	5.245	3933.8	-59	3874.8
17	4	79	400	5.242	3931.5	-59	3872.5
17	4	79	500	5.244	3933.0	-59	3874.0
17	4	79	600	5.246	3934.5	-59	3875.5
17	4	79	700	5.248	3936.0	-59	3877.0
17	4	79	800	5.245	3933.8	-59	3874.8
17	4	79	900	5.250	3937.5	-59	3878.5
17	4	79	1000	5.250	3937.5	-59	3878.5
17	4	79	1100	5.250	3937.5	-59	3878.5
17	4	79	1200	5.253	3939.8	-59	3880.8
17	4	79	1300	5.255	3941.3	-59	3882.3
17	4	79	1400	5.257	3942.8	-59	3883.8
17	4	79	1500	5.260	3945.0	-59	3886.0
17	4	79	1600	5.262	3946.5	-59	3887.5
17	4	79	1700	5.265	3948.8	-59	3889.8
17	4	79	1800	5.265	3948.8	-59	3889.8
17	4	79	1900	5.266	3949.5	-59	3890.5
17	4	79	2000	5.268	3951.0	-59	3892.0
17	4	79	2100	5.262	3946.5	-59	3887.5
17	4	79	2200	5.264	3948.0	-59	3889.0
17	4	79	2300	5.262	3946.5	-59	3887.5
18	4	79	0	5.262	3946.5	-59	3887.5
18	4	79	100	5.260	3945.0	-59	3886.0
18	4	79	200	5.261	3945.8	-59	3886.8
18	4	79	300	5.260	3945.0	-59	3886.0
18	4	79	400	5.259	3944.3	-59	3885.3
18	4	79	500	5.259	3944.3	-59	3885.3
18	4	79	600	5.259	3944.3	-59	3885.3
18	4	79	700	5.259	3944.3	-59	3885.3
18	4	79	800	5.259	3944.3	-59	3885.3
18	4	79	900	5.254	3940.5	-59	3881.5
18	4	79	1000	5.252	3939.0	-59	3880.0
18	4	79	1100	5.249	3936.8	-59	3877.8
18	4	79	1200	5.246	3934.5	-59	3875.5
18	4	79	1300	5.247	3935.3	-59	3876.3
18	4	79	1400	5.249	3936.8	-59	3877.8
18	4	79	1500	5.251	3938.3	-59	3879.3
18	4	79	1600	5.251	3938.3	-59	3879.3
18	4	79	1700	5.251	3938.3	-59	3879.3
18	4	79	1800	5.252	3939.0	-59	3880.0
18	4	79	1900	5.250	3937.5	-59	3878.5
18	4	79	2000	5.252	3939.0	-59	3880.0
18	4	79	2100	5.255	3941.3	-59	3882.3
18	4	79	2200	5.256	3942.0	-59	3883.0
18	4	79	2300	5.258	3943.5	-59	3884.5
19	4	79	0	5.259	3944.3	-59	3885.3
19	4	79	100	5.260	3945.0	-59	3886.0
19	4	79	200	5.260	3945.0	-59	3886.0
19	4	79	300	5.260	3945.0	-59	3886.0
19	4	79	400	5.261	3945.8	-59	3886.8
19	4	79	500	5.262	3946.5	-59	3887.5
19	4	79	600	5.265	3948.8	-59	3889.8
19	4	79	700	5.265	3948.8	-59	3889.8
19	4	79	800	5.265	3948.8	-59	3889.8
19	4	79	900	5.265	3948.8	-59	3889.8
19	4	79	1000	5.266	3949.5	-59	3890.5
19	4	79	1100	5.268	3951.0	-58	3893.0
19	4	79	1200	5.269	3951.8	-58	3893.8
19	4	79	1300	5.270	3952.5	-58	3894.5
19	4	79	1400	5.270	3952.5	-58	3894.5
19	4	79	1500	5.270	3952.5	-58	3894.5

## FRAM 1 DEPTH DATA

DT	AN	TR	GMT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
19	4	79	1600	5.270	3952.5	-58	3894.5
19	4	79	1700	5.271	3953.3	-58	3895.3
19	4	79	1800	5.271	3953.3	-58	3895.3
19	4	79	1900	5.271	3953.3	-58	3895.3
19	4	79	2000	5.271	3953.3	-58	3895.3
19	4	79	2100	5.275	3956.3	-58	3898.3
19	4	79	2200	5.276	3957.0	-58	3899.0
19	4	79	2300	5.278	3958.5	-58	3900.5
20	4	79	0	5.279	3959.3	-58	3901.3
20	4	79	100	5.280	3960.0	-58	3902.0
20	4	79	200	5.280	3960.0	-58	3902.0
20	4	79	300	5.280	3960.0	-58	3902.0
20	4	79	400	5.282	3961.5	-58	3903.5
20	4	79	500	5.282	3961.5	-58	3903.5
20	4	79	600	5.285	3963.8	-58	3905.8
20	4	79	700	5.286	3964.5	-58	3906.5
20	4	79	800	5.288	3966.0	-58	3908.0
20	4	79	900	5.289	3966.8	-58	3908.8
20	4	79	1000	5.290	3967.5	-58	3909.5
20	4	79	1100	5.290	3967.5	-58	3909.5
20	4	79	1200	5.290	3967.5	-58	3909.5
20	4	79	1300	5.290	3967.5	-58	3909.5
20	4	79	1400	5.290	3967.5	-58	3909.5
20	4	79	1500	5.283	3962.3	-58	3904.3
20	4	79	1600	5.271	3953.3	-58	3895.3
20	4	79	1700	5.062	3796.5	-60	3736.5
20	4	79	1800	5.033	3774.8	-60	3714.8
20	4	79	1900	5.040	3780.0	-60	3720.0
20	4	79	2000	5.040	3780.0	-60	3720.0
20	4	79	2100	5.026	3769.5	-60	3709.5
20	4	79	2200	5.020	3765.0	-60	3705.0
20	4	79	2300	5.020	3765.0	-60	3705.0
21	4	79	0	5.028	3771.0	-60	3711.0
21	4	79	100	5.041	3780.8	-60	3720.8
21	4	79	200	5.056	3792.0	-60	3732.0
21	4	79	300	5.066	3799.5	-60	3739.5
21	4	79	400	5.059	3794.3	-60	3734.3
21	4	79	500	5.056	3792.0	-60	3732.0
21	4	79	600	5.056	3792.0	-60	3732.0
21	4	79	700	5.060	3795.0	-60	3735.0
21	4	79	800	5.068	3801.0	-60	3741.0
21	4	79	900	5.100	3825.0	-60	3765.0
21	4	79	1000	5.150	3862.5	-59	3803.5
21	4	79	1100	5.170	3877.5	-59	3818.5
21	4	79	1200	5.186	3889.5	-59	3830.5
21	4	79	1300	5.219	3914.3	-59	3855.3
21	4	79	1400	5.226	3919.5	-59	3860.5
21	4	79	1500	5.237	3927.8	-59	3868.8
21	4	79	1600	5.285	3963.8	-58	3905.8
21	4	79	1700	5.315	3986.3	-58	3928.3
21	4	79	1800	5.320	3990.0	-58	3932.0
21	4	79	1900	5.324	3993.0	-58	3935.0
21	4	79	2000	5.329	3996.8	-58	3938.8
21	4	79	2100	5.332	3999.0	-58	3941.0
21	4	79	2200	5.335	4001.3	-58	3943.3
21	4	79	2300	5.338	4003.5	-58	3945.5
22	4	79	0	5.340	4005.0	-58	3947.0
22	4	79	100	5.340	4005.0	-58	3947.0
22	4	79	200	5.341	4005.8	-58	3947.8
22	4	79	300	5.341	4005.8	-58	3947.8
22	4	79	400	5.342	4006.5	-58	3948.5
22	4	79	500	5.344	4008.0	-58	3950.0
22	4	79	600	5.345	4008.8	-58	3950.8
22	4	79	700	5.345	4008.8	-58	3950.8
22	4	79	800	5.345	4008.8	-58	3950.8
22	4	79	900	5.347	4010.3	-58	3952.3
22	4	79	1000	5.349	4011.8	-58	3953.8
22	4	79	1100	5.350	4012.5	-58	3954.5

## FRAM I DEPTH DATA

DY	MO	YR	GMT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
22	4	79	1200	5.350	4012.5	-58	3954.5
22	4	79	1300	5.350	4012.5	-58	3954.5
22	4	79	1400	5.350	4012.5	-58	3954.5
22	4	79	1500	5.350	4012.5	-58	3954.5
22	4	79	1600	5.350	4012.5	-58	3954.5
22	4	79	1700	5.350	4012.5	-58	3954.5
22	4	79	1800	5.350	4012.5	-58	3954.5
22	4	79	1900	5.350	4012.5	-58	3954.5
22	4	79	2000	5.349	4011.8	-58	3953.8
22	4	79	2100	5.350	4012.5	-58	3954.5
22	4	79	2200	5.350	4012.5	-58	3954.5
22	4	79	2300	5.349	4011.8	-58	3953.8
23	4	79	0	5.348	4011.0	-58	3953.0
23	4	79	100	5.348	4011.0	-58	3953.0
23	4	79	200	5.346	4009.5	-58	3951.5
23	4	79	300	5.345	4008.8	-58	3950.8
23	4	79	400	5.347	4010.3	-58	3952.3
23	4	79	500	5.346	4009.5	-58	3951.5
23	4	79	600	5.332	3999.0	-58	3941.0
23	4	79	700	5.271	3953.3	-58	3895.3
23	4	79	800	5.190	3895.5	-59	3833.5
23	4	79	900	4.877	3657.8	-60	3597.8
23	4	79	1000	4.836	3627.0	-61	3566.0
23	4	79	1100	4.786	3589.5	-61	3528.5
23	4	79	1200	4.767	3575.3	-61	3514.3
23	4	79	1300	4.728	3546.0	-61	3485.0
23	4	79	1400	4.700	3525.0	-61	3464.0
23	4	79	1500	4.679	3509.3	-61	3448.3
23	4	79	1600	4.651	3488.3	-61	3427.3
23	4	79	1700	4.619	3464.3	-61	3403.3
23	4	79	1800	4.610	3457.5	-61	3396.5
23	4	79	1900	4.601	3450.8	-61	3389.8
23	4	79	2000	4.592	3444.0	-60	3384.0
23	4	79	2100	4.583	3437.3	-60	3377.3
23	4	79	2200	4.580	3435.0	-60	3375.0
23	4	79	2300	4.575	3431.3	-60	3371.3
24	4	79	0	4.575	3431.3	-60	3371.3
24	4	79	100	4.576	3432.0	-60	3372.0
24	4	79	200	4.574	3430.5	-60	3370.5
24	4	79	300	4.575	3431.3	-60	3371.3
24	4	79	400	4.570	3427.5	-60	3367.5
24	4	79	500	4.569	3426.8	-60	3366.8
24	4	79	600	4.568	3426.0	-60	3366.0
24	4	79	700	4.563	3422.3	-60	3362.3
24	4	79	800	4.560	3420.0	-60	3360.0
24	4	79	900	4.557	3417.8	-60	3357.8
24	4	79	1000	4.551	3413.3	-60	3353.3
24	4	79	1100	4.550	3412.5	-60	3352.5
24	4	79	1200	4.550	3412.5	-60	3352.5
24	4	79	1300	4.548	3411.0	-60	3351.0
24	4	79	1400	4.548	3411.0	-60	3351.0
24	4	79	1500	4.684	3513.0	-61	3452.0
24	4	79	1600	4.820	3615.0	-61	3554.0
24	4	79	1700	4.956	3717.0	-60	3657.0
24	4	79	1800	5.092	3819.0	-60	3759.0
24	4	79	1900	5.228	3921.0	-59	3862.0
24	4	79	2000	5.228	3921.0	-59	3862.0
24	4	79	2100	5.232	3924.0	-59	3865.0
24	4	79	2200	5.266	3949.5	-59	3890.5
24	4	79	2300	5.338	4003.5	-58	3945.5
25	4	79	0	5.338	4003.5	-58	3945.5
25	4	79	100	5.310	3982.5	-58	3924.5
25	4	79	200	5.299	3974.3	-58	3916.3
25	4	79	300	5.291	3968.3	-58	3910.3
25	4	79	400	5.286	3964.5	-58	3906.5
25	4	79	500	5.278	3958.5	-58	3900.5
25	4	79	600	5.268	3951.0	-58	3893.0
25	4	79	700	5.265	3948.8	-59	3889.8



## FRAM I DEPTH DATA

DI	MN	IR	GMT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
25	4	79	800	5.260	3945.0	-59	3886.0
25	4	79	900	5.264	3948.0	-59	3889.0
25	4	79	1000	5.263	3947.3	-59	3888.3
25	4	79	1100	5.271	3953.3	-58	3895.3
25	4	79	1200	5.270	3952.5	-58	3894.5
25	4	79	1300	5.275	3956.3	-58	3898.3
25	4	79	1400	5.280	3960.0	-58	3902.0
25	4	79	1500	5.285	3963.8	-58	3905.8
25	4	79	1600	5.290	3967.5	-58	3909.5
25	4	79	1700	5.294	3970.5	-58	3912.5
25	4	79	1800	5.298	3973.5	-58	3915.5
25	4	79	1900	5.298	3973.5	-58	3915.5
25	4	79	2000	5.301	3975.8	-58	3917.8
25	4	79	2100	5.302	3976.5	-58	3918.5
25	4	79	2200	5.305	3978.8	-58	3920.8
25	4	79	2300	5.305	3978.8	-58	3920.8
26	4	79	0	5.305	3978.8	-58	3920.8
26	4	79	100	5.307	3980.3	-58	3922.3
26	4	79	200	5.308	3981.0	-58	3923.0
26	4	79	300	5.308	3981.0	-58	3923.0
26	4	79	400	5.308	3981.0	-58	3923.0
26	4	79	500	5.309	3981.8	-58	3923.8
26	4	79	600	5.309	3981.8	-58	3923.8
26	4	79	700	5.309	3981.8	-58	3923.8
26	4	79	800	5.309	3981.8	-58	3923.8
26	4	79	900	5.310	3982.5	-58	3924.5
26	4	79	1000	5.310	3982.5	-58	3924.5
26	4	79	1100	5.312	3984.0	-58	3926.0
26	4	79	1200	5.312	3984.0	-58	3926.0
26	4	79	1300	5.314	3985.5	-58	3927.5
26	4	79	1400	5.314	3985.5	-58	3927.5
26	4	79	1500	5.314	3985.5	-58	3927.5
26	4	79	1600	5.315	3986.3	-58	3928.3
26	4	79	1700	5.314	3985.5	-58	3927.5
26	4	79	1800	5.314	3985.5	-58	3927.5
26	4	79	1900	5.314	3985.5	-58	3927.5
26	4	79	2000	5.315	3986.3	-58	3928.3
26	4	79	2100	5.315	3986.3	-58	3928.3
26	4	79	2200	5.317	3987.8	-58	3929.8
26	4	79	2300	5.318	3988.5	-58	3930.5
27	4	79	0	5.318	3988.5	-58	3930.5
27	4	79	100	5.318	3988.5	-58	3930.5
27	4	79	200	5.318	3988.5	-58	3930.5
27	4	79	300	5.318	3988.5	-58	3930.5
27	4	79	400	5.318	3988.5	-58	3930.5
27	4	79	500	5.318	3988.5	-58	3930.5
27	4	79	600	5.318	3988.5	-58	3930.5
27	4	79	700	5.319	3989.3	-58	3931.3
27	4	79	800	5.319	3989.3	-58	3931.3
27	4	79	900	5.319	3989.3	-58	3931.3
27	4	79	1000	5.319	3989.3	-58	3931.3
27	4	79	1100	5.320	3990.0	-58	3932.0
27	4	79	1200	5.320	3990.0	-58	3932.0
27	4	79	1300	5.320	3990.0	-58	3932.0
27	4	79	1400	5.320	3990.0	-58	3932.0
27	4	79	1500	5.321	3990.8	-58	3932.8
27	4	79	1600	5.320	3990.0	-58	3932.0
27	4	79	1700	5.320	3990.0	-58	3932.0
27	4	79	1800	5.320	3990.0	-58	3932.0
27	4	79	1900	5.319	3989.3	-58	3931.3
27	4	79	2000	5.319	3989.3	-58	3931.3
27	4	79	2100	5.319	3989.3	-58	3931.3
27	4	79	2200	5.319	3989.3	-58	3931.3
27	4	79	2300	5.319	3989.3	-58	3931.3
28	4	79	0	5.318	3988.5	-58	3930.5
28	4	79	100	5.318	3988.5	-58	3930.5
28	4	79	200	5.316	3987.0	-58	3929.0
28	4	79	300	5.316	3987.0	-58	3929.0

## FRAM 1 DEPTH DATA

DT	NN	IR	GMT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
28	4	79	400	5.315	3986.3	-58	3928.3
28	4	79	500	5.315	3986.3	-58	3928.3
28	4	79	600	5.315	3986.3	-58	3928.3
28	4	79	700	5.314	3985.5	-58	3927.5
28	4	79	800	5.313	3984.8	-58	3926.8
28	4	79	900	5.312	3984.0	-58	3926.0
28	4	79	1000	5.312	3984.0	-58	3926.0
28	4	79	1100	5.311	3983.3	-58	3925.3
28	4	79	1200	5.311	3983.3	-58	3925.3
28	4	79	1300	5.312	3984.0	-58	3926.0
28	4	79	1400	5.312	3984.0	-58	3926.0
28	4	79	1500	5.312	3984.0	-58	3926.0
28	4	79	1600	5.311	3983.3	-58	3925.3
28	4	79	1700	5.310	3982.5	-58	3924.5
28	4	79	1800	5.310	3982.5	-58	3924.5
28	4	79	1900	5.310	3982.5	-58	3924.5
28	4	79	2000	5.310	3982.5	-58	3924.5
28	4	79	2100	5.311	3983.3	-58	3925.3
28	4	79	2200	5.311	3983.3	-58	3925.3
28	4	79	2300	5.312	3984.0	-58	3926.0
29	4	79	0	5.312	3984.0	-58	3926.0
29	4	79	100	5.313	3984.8	-58	3926.8
29	4	79	200	5.314	3985.5	-58	3927.5
29	4	79	300	5.315	3986.3	-58	3928.3
29	4	79	400	5.315	3986.3	-58	3928.3
29	4	79	500	5.318	3988.5	-58	3930.5
29	4	79	600	5.316	3987.0	-58	3929.0
29	4	79	700	5.318	3988.5	-58	3930.5
29	4	79	800	5.319	3989.3	-58	3931.3
29	4	79	900	5.320	3990.0	-58	3932.0
29	4	79	1000	5.321	3990.8	-58	3932.8
29	4	79	1100	5.325	3993.8	-58	3935.8
29	4	79	1200	5.326	3994.5	-58	3936.5
29	4	79	1300	5.328	3996.0	-58	3938.0
29	4	79	1400	5.329	3996.8	-58	3938.8
29	4	79	1500	5.330	3997.5	-58	3939.5
29	4	79	1600	5.330	3997.5	-58	3939.5
29	4	79	1700	5.330	3997.5	-58	3939.5
29	4	79	1800	5.331	3998.3	-58	3940.3
29	4	79	1900	5.331	3998.3	-58	3940.3
29	4	79	2000	5.331	3998.3	-58	3940.3
29	4	79	2100	5.331	3998.3	-58	3940.3
29	4	79	2200	5.331	3998.3	-58	3940.3
29	4	79	2300	5.331	3998.3	-58	3940.3
30	4	79	0	5.331	3998.3	-58	3940.3
30	4	79	100	5.331	3998.3	-58	3940.3
30	4	79	200	5.331	3998.3	-58	3940.3
30	4	79	300	5.331	3998.3	-58	3940.3
30	4	79	400	5.331	3998.3	-58	3940.3
30	4	79	500	5.331	3998.3	-58	3940.3
30	4	79	600	5.331	3998.3	-58	3940.3
30	4	79	700	5.331	3998.3	-58	3940.3
30	4	79	800	5.331	3998.3	-58	3940.3
30	4	79	900	5.330	3997.0	-58	3939.0
30	4	79	1000	5.330	3997.0	-58	3939.0
30	4	79	1100	5.281	3960.8	-58	3902.8
30	4	79	1200	5.250	3937.5	-59	3878.5
30	4	79	1300	5.229	3921.8	-59	3862.8
30	4	79	1400	5.195	3896.3	-59	3837.3
30	4	79	1500	5.161	3870.8	-59	3811.8
30	4	79	1600	5.127	3845.3	-60	3785.3
30	4	79	1700	5.093	3819.8	-60	3759.8
30	4	79	1800	5.060	3795.0	-60	3735.0
30	4	79	1900	5.043	3782.3	-60	3722.3
30	4	79	2000	5.033	3774.8	-60	3714.8
30	4	79	2100	5.022	3766.5	-60	3706.5
30	4	79	2200	5.011	3758.3	-60	3698.3
30	4	79	2300	5.000	3750.0	-60	3690.0

## FRAM 1 DEPTH DATA

DI	HN	TR	GMT	SECONDS	METERS (UNCORR)	VEL CURR	METERS (CURR)
1	S	79	0	4.972	3729.0	-60	3669.0
1	S	79	100	4.908	3681.0	-60	3621.0
1	S	79	200	4.870	3652.5	-60	3592.5
1	S	79	300	4.830	3622.5	-61	3561.5
1	S	79	400	4.788	3591.0	-61	3530.0
1	S	79	500	4.738	3553.5	-61	3492.5
1	S	79	600	4.689	3516.8	-61	3455.8
1	S	79	700	4.630	3472.5	-61	3411.5
1	S	79	800	4.589	3441.8	-60	3388.8
1	S	79	900	4.559	3419.3	-60	3359.3
1	S	79	1000	4.520	3390.0	-60	3330.0
1	S	79	1100	4.485	3363.8	-60	3303.8
1	S	79	1200	4.432	3324.0	-60	3264.0
1	S	79	1300	4.375	3281.3	-61	3220.3
1	S	79	1400	4.350	3262.5	-61	3201.5
1	S	79	1500	4.370	3277.5	-61	3216.5
1	S	79	1600	4.438	3328.5	-60	3268.5
1	S	79	1700	4.545	3408.8	-60	3348.8
1	S	79	1800	4.736	3552.0	-61	3491.2
1	S	79	1900	4.966	3724.5	-60	3664.5
1	S	79	2000	4.983	3737.3	-60	3677.3
1	S	79	2100	5.000	3750.0	-60	3690.0
1	S	79	2200	5.125	3843.8	-60	3783.8
1	S	79	2300	5.135	3851.3	-59	3792.3
2	S	79	0	5.149	3861.8	-59	3802.8
2	S	79	100	5.171	3878.3	-59	3819.3
2	S	79	200	5.189	3891.8	-59	3832.8
2	S	79	300	5.201	3900.8	-59	3841.8
2	S	79	400	5.209	3906.8	-59	3847.8
2	S	79	500	5.205	3903.8	-59	3844.8
2	S	79	600	5.192	3874.0	-59	3835.0
2	S	79	700	5.110	3832.5	-60	3772.5
2	S	79	800	5.118	3838.5	-60	3778.5
2	S	79	900	5.127	3845.3	-60	3785.3
2	S	79	1000	5.150	3862.5	-59	3803.5
2	S	79	1100	5.170	3877.5	-59	3818.5
2	S	79	1200	5.176	3882.0	-59	3823.0
2	S	79	1300	5.177	3882.8	-59	3823.8
2	S	79	1400	5.193	3894.8	-59	3835.8
2	S	79	1500	5.208	3906.0	-59	3847.0
2	S	79	1600	5.235	3926.3	-59	3867.3
2	S	79	1700	5.239	3929.3	-59	3870.3
2	S	79	1800	5.246	3934.5	-59	3875.5
2	S	79	1900	5.240	3930.0	-59	3871.0
2	S	79	2000	5.237	3927.8	-59	3868.8
2	S	79	2100	5.235	3926.3	-59	3867.3
2	S	79	2200	5.231	3923.3	-59	3864.3
2	S	79	2300	5.240	3930.0	-59	3871.0
3	S	79	0	5.239	3929.3	-59	3870.3
3	S	79	100	5.232	3924.0	-59	3865.0
3	S	79	200	5.198	3898.5	-59	3839.5
3	S	79	300	5.185	3888.8	-59	3829.8
3	S	79	400	5.176	3882.0	-59	3823.0
3	S	79	500	5.130	3847.5	-60	3787.5
3	S	79	600	5.047	3785.3	-60	3725.3
3	S	79	700	5.025	3768.8	-60	3708.8
3	S	79	800	5.023	3767.3	-60	3707.3
3	S	79	900	5.020	3765.0	-60	3705.0
3	S	79	1000	4.911	3683.3	-60	3623.3
3	S	79	1100	4.802	3601.5	-61	3540.5
3	S	79	1200	4.692	3519.0	-61	3458.0
3	S	79	1300	4.644	3483.0	-61	3422.0
3	S	79	1400	4.720	3540.0	-61	3479.0
3	S	79	1500	4.796	3597.0	-61	3536.0
3	S	79	1600	4.852	3639.0	-61	3578.0
3	S	79	1700	4.851	3638.3	-61	3577.3
3	S	79	1800	4.820	3615.0	-61	3554.0
3	S	79	1900	4.813	3609.8	-61	3548.8

## FRAM 1 DEPTH DATA

DT	BN	TR	GAT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
3	5	79	2000	4.873	3654.8	-60	3594.8
3	5	79	2100	4.934	3700.5	-60	3640.5
3	5	79	2200	4.921	3690.8	-60	3630.8
3	5	79	2300	4.919	3689.3	-60	3629.3
4	5	79	0	4.920	3690.0	-60	3630.0
4	5	79	100	4.919	3689.3	-60	3629.3
4	5	79	200	4.915	3686.3	-60	3623.3
4	5	79	300	4.910	3682.5	-60	3622.5
4	5	79	400	4.911	3683.3	-60	3623.3
4	5	79	500	4.909	3681.8	-60	3621.8
4	5	79	600	4.907	3680.3	-60	3620.3
4	5	79	700	4.906	3678.5	-60	3619.5
4	5	79	800	4.906	3679.5	-60	3619.5
4	5	79	900	4.905	3678.8	-60	3618.8
4	5	79	1000	4.890	3667.5	-60	3607.5
4	5	79	1100	4.869	3651.8	-60	3591.8
4	5	79	1200	4.835	3626.3	-61	3565.3
4	5	79	1300	4.797	3597.8	-61	3536.8
4	5	79	1400	4.760	3570.0	-61	3509.0
4	5	79	1500	4.730	3547.5	-61	3486.5
4	5	79	1600	4.610	3457.5	-61	3396.5
4	5	79	1700	4.492	3369.0	-60	3309.0
4	5	79	1800	4.400	3300.0	-60	3240.0
4	5	79	1900	4.314	3235.5	-61	3174.5
4	5	79	2000	4.183	3137.3	-61	3076.3
4	5	79	2100	4.051	3038.3	-61	2977.3
5	5	79	1000	3.940	2955.0	-61	2894.0
5	5	79	1100	3.921	2940.8	-60	2880.8
5	5	79	1200	3.920	2940.0	-60	2880.0
5	5	79	1300	3.920	2940.0	-60	2880.0
5	5	79	1400	3.935	2951.3	-61	2890.3
5	5	79	1500	3.949	2961.8	-61	2900.8
5	5	79	1600	4.024	3018.0	-61	2957.0
5	5	79	1700	4.112	3084.0	-61	3023.0
5	5	79	1800	4.120	3090.0	-61	3029.0
5	5	79	1900	4.156	3117.0	-61	3056.0
5	5	79	2000	4.144	3108.0	-61	3047.0
5	5	79	2100	4.132	3099.0	-61	3038.0
5	5	79	2200	4.080	3060.0	-61	2999.0
5	5	79	2300	4.061	3045.8	-61	2984.8
6	5	79	0	4.080	3060.0	-61	2999.0
6	5	79	100	4.105	3078.8	-61	3017.8
6	5	79	200	4.123	3092.3	-61	3031.3
6	5	79	300	4.134	3100.5	-61	3039.5
6	5	79	400	4.214	3160.5	-61	3099.5
6	5	79	500	4.176	3207.0	-61	3146.0
6	5	79	600	4.295	3221.3	-61	3160.3
6	5	79	700	4.300	3225.0	-61	3164.0
6	5	79	800	4.250	3187.5	-61	3126.5
6	5	79	900	4.250	3187.5	-61	3126.5
6	5	79	1000	4.226	3169.5	-61	3108.5
6	5	79	1100	4.193	3144.8	-61	3083.8
6	5	79	1200	4.190	3142.5	-61	3081.5
6	5	79	1300	4.127	3095.3	-61	3034.3
6	5	79	1400	4.084	3063.0	-61	3002.0
6	5	79	1500	4.100	3075.0	-61	3014.0
6	5	79	1600	4.098	3073.5	-61	3012.5
6	5	79	1700	4.100	3075.0	-61	3014.0
6	5	79	1800	4.083	3062.3	-61	3001.3
6	5	79	1900	4.056	3042.0	-61	2981.0
6	5	79	2000	3.930	2947.5	-60	2887.5
6	5	79	2100	3.872	2904.0	-60	2844.0
6	5	79	2200	3.790	2842.5	-60	2782.5
6	5	79	2300	3.790	2842.5	-60	2785.5
7	5	79	0	3.758	2818.5	-60	2758.5
7	5	79	100	3.619	2714.3	-59	2655.3
7	5	79	200	3.376	2532.0	-58	2474.0
7	5	79	300	3.390	2542.5	-58	2484.5



## FRAM 1 DEPTH DATA

DY	MN	YR	GAT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
7	5	79	400	3.287	2465.3	-58	2407.3
7	5	79	500	3.199	2399.3	-57	2342.3
7	5	79	600	3.180	2385.0	-57	2328.0
7	5	79	700	3.132	2349.0	-56	2293.0
7	5	79	800	3.069	2301.8	-56	2245.8
7	5	79	900	3.047	2285.3	-55	2230.3
7	5	79	1000	3.022	2266.5	-55	2211.5
7	5	79	1100	3.062	2296.5	-55	2241.5
7	5	79	1200	3.059	2294.3	-55	2239.3
7	5	79	1300	3.080	2310.0	-56	2254.0
7	5	79	1400	3.174	2380.5	-57	2323.5
7	5	79	1500	3.335	2501.3	-58	2443.3
7	5	79	1600	3.415	2561.3	-58	2503.3
7	5	79	1700	3.439	2579.3	-58	2521.3
7	5	79	1800	3.439	2579.3	-58	2521.3
7	5	79	1900	3.445	2583.8	-58	2525.8
7	5	79	2000	3.465	2598.8	-58	2540.8
7	5	79	2100	3.428	2571.0	-58	2513.0
7	5	79	2200	3.414	2560.5	-58	2502.5
7	5	79	2300	3.400	2550.0	-58	2492.0
8	5	79	0	3.402	2551.5	-58	2493.5
8	5	79	100	3.394	2545.5	-58	2487.5
8	5	79	200	3.398	2548.5	-58	2490.5
8	5	79	300	3.449	2586.8	-58	2528.8
8	5	79	400	3.545	2658.8	-59	2599.8
8	5	79	500	3.790	2842.5	-60	2782.5
8	5	79	600	3.814	2860.5	-60	2800.5
8	5	79	700	3.815	2861.3	-60	2801.3
8	5	79	800	3.724	2793.0	-60	2733.0
8	5	79	900	3.674	2755.5	-60	2695.5
8	5	79	1000	3.634	2725.5	-59	2666.5
8	5	79	1100	3.594	2695.5	-59	2636.5
8	5	79	1200	3.615	2711.3	-59	2652.3
8	5	79	1300	3.655	2741.3	-59	2682.3
8	5	79	1400	3.718	2788.5	-60	2728.5
8	5	79	1500	3.877	2907.8	-60	2847.8
8	5	79	1600	3.976	2982.0	-61	2921.0
8	5	79	1700	3.990	2992.5	-61	2931.5
8	5	79	1800	4.018	3013.5	-61	2952.5
8	5	79	1900	4.015	3011.3	-61	2950.3
8	5	79	2000	4.000	3000.0	-61	2939.0
8	5	79	2100	3.945	2958.8	-61	2897.8
8	5	79	2200	3.921	2940.8	-60	2880.8
8	5	79	2300	3.917	2937.8	-60	2877.8
9	5	79	0	3.910	2932.5	-60	2872.5
9	5	79	100	3.938	2953.5	-61	2892.5
9	5	79	200	3.940	2955.0	-61	2894.0
9	5	79	300	3.913	2934.8	-60	2874.8
9	5	79	400	3.830	2872.5	-60	2812.5
9	5	79	500	3.730	2797.5	-60	2737.5
9	5	79	600	3.666	2749.5	-59	2690.5
9	5	79	700	3.505	2628.8	-58	2570.8
9	5	79	800	3.432	2574.0	-58	2516.0
9	5	79	900	3.291	2468.3	-58	2410.3
9	5	79	1000	3.220	2415.0	-57	2358.0
9	5	79	1100	3.134	2350.5	-57	2293.5
9	5	79	1200	3.118	2338.5	-56	2282.5
9	5	79	1300	3.165	2373.8	-57	2316.8
9	5	79	1400	3.170	2377.5	-57	2320.5
9	5	79	1500	3.157	2367.8	-57	2310.8
9	5	79	1600	3.138	2353.5	-57	2296.5
9	5	79	1700	3.090	2317.5	-56	2261.5
9	5	79	1800	3.080	2310.0	-56	2254.0
9	5	79	1900	3.070	2302.5	-56	2246.5
9	5	79	2000	3.108	2331.0	-56	2275.0
9	5	79	2100	3.130	2347.5	-56	2291.5
9	5	79	2200	3.160	2370.0	-57	2313.0
9	5	79	2300	3.182	2386.5	-57	2329.5

## FRAM 1 DEPTH DATA

DT	HR	IR	GMT	SECONDS	METERS (UNCORR)	VEL CORR	METERS (CORR)
10	5	79	0	3.198	2398.5	-57	2341.5
10	5	79	100	3.230	2422.5	-57	2365.5
10	5	79	200	3.224	2418.0	-57	2361.0
10	5	79	300	3.232	2424.0	-57	2367.0
10	5	79	400	3.225	2418.8	-57	2361.8
10	5	79	500	3.290	2467.5	-58	2409.5
10	5	79	600	3.334	2500.5	-58	2442.5
10	5	79	700	3.365	2523.8	-58	2465.8
10	5	79	800	3.370	2527.5	-58	2469.5
10	5	79	900	3.400	2550.0	-58	2492.0
10	5	79	1000	3.419	2564.3	-58	2506.3
10	5	79	1100	3.432	2574.0	-58	2516.0
10	5	79	1200	3.422	2566.5	-58	2508.5
10	5	79	1300	3.389	2541.8	-58	2483.8
10	5	79	1400	3.399	2549.3	-58	2491.3
10	5	79	1500	3.418	2563.5	-58	2505.5
10	5	79	1600	3.412	2559.0	-58	2501.0
10	5	79	1700	3.400	2550.0	-58	2492.0
10	5	79	1800	3.400	2550.0	-58	2492.0
10	5	79	1900	3.400	2550.0	-58	2492.0
10	5	79	2000	3.400	2550.0	-58	2492.0
10	5	79	2100	3.400	2550.0	-58	2492.0
10	5	79	2200	3.400	2550.0	-58	2492.0
10	5	79	2300	3.400	2550.0	-58	2492.0
11	5	79	0	3.400	2550.0	-58	2492.0
11	5	79	100	3.400	2550.0	-58	2492.0
11	5	79	200	3.400	2550.0	-58	2492.0
11	5	79	300	3.400	2550.0	-58	2492.0
11	5	79	400	3.401	2550.8	-58	2492.8
11	5	79	500	3.401	2550.8	-58	2492.8
11	5	79	600	3.408	2556.0	-58	2498.0
11	5	79	700	3.406	2554.5	-58	2496.5
11	5	79	800	3.411	2558.3	-58	2550.3
11	5	79	900	3.409	2556.8	-58	2498.8
11	5	79	1000	3.403	2552.3	-58	2494.3
11	5	79	1100	3.390	2542.5	-58	2484.5
11	5	79	1200	3.378	2533.5	-58	2475.5
11	5	79	1300	3.365	2523.8	-58	2465.8
11	5	79	1400	3.353	2514.8	-58	2456.8
11	5	79	1500	3.348	2511.0	-58	2453.0
11	5	79	1600	3.340	2505.0	-58	2447.0
11	5	79	1700	3.263	2447.3	-57	2390.3
11	5	79	1800	3.190	2392.5	-57	2335.5
11	5	79	1900	3.125	2343.8	-56	2287.8
11	5	79	2000	3.058	2293.5	-55	2238.5
11	5	79	2100	3.040	2280.0	-55	2225.0
11	5	79	2200	3.048	2286.0	-55	2231.0
11	5	79	2300	3.066	2299.5	-55	2244.5
12	5	79	0	3.108	2331.0	-56	2275.0
12	5	79	100	3.152	2364.0	-57	2307.0
12	5	79	200	3.180	2385.0	-57	2328.0
12	5	79	300	3.190	2392.5	-57	2335.5
12	5	79	400	3.165	2373.8	-57	2316.8
12	5	79	500	3.139	2354.3	-57	2297.3
12	5	79	600	3.127	2345.3	-56	2289.3
12	5	79	700	3.129	2346.8	-56	2290.8
12	5	79	800	3.143	2357.3	-57	2300.3
12	5	79	900	3.149	2361.8	-57	2304.8

GRAVITY OBSERVATIONS AT FRAM I

Key to column headings:

DY = Day

MN = Month

YR = Year

GMT = Greenwich mean time

CTR RDG = Counter reading

MGALS = Relative gravity in milligals

GRAVITY = Gravity value

## Gravity

The earth's gravity field was monitored during the station drift with a La Coste and Romberg Model G gravimeter. This instrument has a range of over 7000 milligals, a reading accuracy of  $\pm 0.01$  milligal and a drift rate normally less than 1 milligal per month. The instrument used, serial number 27, was especially modified for use on ice floes by the addition of variable damping and electronic readout. Gravity output was monitored continuously with a chart recorder but only those values read directly for calibrating the chart are reported here. The instrument was located in the Lamont residence hut at FRAM I where it was mounted on a wooden pier frozen into the ice floe. The pier extended through a hole in the floor of the hut and was free of any contact with the hut itself. The instrument was at an elevation of  $1/2$  m above sea level.

The gravity readings were calibrated with readings at Lamont, Thule and Nord. The manufacturer's screw curve for the instrument was checked between the gravity pier in the Oceanography Building at Lamont and Hangar #7 (SE corner, field level) at Thule AFB, Greenland. The difference in gravity between the two points is over 2600 milligals yet the difference based on the manufacturer's screw curve was found to give a gravity tie within 2 milligals of that based on the survey values for these two sites.

Site	Date	Base Surveyed Value (gals.)	Value based on G-27 Rdgs. (gals.)
Thule AFB HGR #7	3/3/79	982.9280	982.92997
Lamont Grav. Pier	2/26/79	980.2546	(980.2546)
Gravity Difference		2.6734	2.67537



Gravity based on our gravimeter readings using the screw curve agree with the accepted surveyed values with a difference of only 1.97 milligals. This check provided confidence in the manufacturer's screw curve which was used to reduce all observations.

Drift is also a possible potential source of error. Readings were taken at the same site at Nord on both the trip to FRAM I and on return. The relative readings at Nord were:

3/13/79	6766.773 mgal
5/17/79	<u>6767.774</u>
Drift	1.00 mgal

The drift rate of 1/2 milligal per month is considered quite small, in fact negligible considering the difficulties of obtaining precise observations on a drifting ice floe which oscillates vertically with periods of about 15s and amplitudes in the millimeter range (Hunkins, 1962).

The FRAM I values are based on the Thule base site. An auxiliary base was established at the geodetic monument near the HQ building at Nord. The instrument was placed on the monument and centered over the pin. The location of the site is reported as  $81^{\circ}36'09''\text{N}$   $16^{\circ}40'12''\text{W}$ . Based on the tie between Thule and Nord in March, the gravity value at the Nord site is 983.0823 gals.

## FRAM 1 GRAVITY DATA

DT	HR	YR	GRT	CIR	RDG	MGALS	GRAVITY
27	3	79	1715	6530.06	6875.25		983194.69
31	3	79	2220	6539.55	6885.24		983204.63
2	4	79	1730	6538.98	6884.04		983204.06
3	4	79	1320	6537.92	6883.52		983202.94
5	4	79	1000	6535.38	6880.85		983200.25
6	4	79	1200	6537.43	6883.01		983202.44
6	4	79	1621	6538.98	6884.64		983204.06
9	4	79	804	6537.98	6883.59		983203.00
9	4	79	806	6540.13	6885.85		983205.25
9	4	79	1545	6540.13	6885.85		983205.25
9	4	79	2115	6541.12	6886.89		983206.31
9	4	79	2217	6541.12	6886.89		983206.31
11	4	79	1210	6541.58	6887.38		983206.81
11	4	79	1610	6542.79	6885.65		983205.06
11	4	79	2359	6543.61	6889.52		983208.94
12	4	79	638	6545.83	6891.65		983211.25
12	4	79	2325	6543.56	6889.46		983208.87
13	4	79	1130	6541.01	6886.78		983206.19
14	4	79	1625	6539.53	6885.22		983204.63
14	4	79	2104	6536.51	6884.14		983203.56
15	4	79	1615	6537.40	6882.98		983202.37
15	4	79	1741	6538.60	6884.24		983203.62
16	4	79	34	6537.90	6883.50		983202.94
16	4	79	651	6539.00	6884.66		983204.06
16	4	79	1655	6539.02	6884.68		983204.06
16	4	79	1710	6539.02	6884.68		983204.06
16	4	79	2343	6539.00	6884.66		983204.06
17	4	79	1444	6538.00	6883.61		983203.00
17	4	79	1605	6538.29	6883.91		983203.31
18	4	79	1236	6536.00	6881.50		983200.94
19	4	79	847	6535.25	6880.71		983200.13
19	4	79	1640	6534.04	6879.44		983198.87
19	4	79	1732	6534.50	6879.92		983199.31
19	4	79	2301	6534.18	6879.58		983199.00
20	4	79	816	6535.18	6880.64		983200.06
20	4	79	1213	6537.00	6882.55		983201.94
20	4	79	2115	6539.00	6884.66		983204.06
21	4	79	642	6537.00	6882.55		983201.94
21	4	79	2010	6531.61	6876.88		983196.31
22	4	79	29	6530.00	6875.18		983194.56
22	4	79	1714	6531.00	6876.24		983195.63
23	4	79	47	6533.90	6879.29		983198.69
23	4	79	918	6535.00	6880.45		983199.87
23	4	79	1645	6536.00	6881.50		983200.94
23	4	79	2123	6537.00	6882.55		983201.94
24	4	79	924	6537.00	6882.55		983201.94
25	4	79	2300	6536.00	6881.50		983200.94
26	4	79	658	6534.00	6879.40		983198.81
27	4	79	1114	6533.30	6878.66		983198.06
29	4	79	1139	6530.00	6875.18		983194.56
30	4	79	113	6532.00	6877.29		983196.69
30	4	79	1827	6533.00	6878.34		983197.75
9	5	79	842	6557.00	6903.62		983223.00
9	5	79	1022	6560.23	6907.02		983226.44
9	5	79	1618	6563.00	6909.94		983229.37
9	5	79	1638	6561.04	6907.87		983227.25
10	5	79	112	6559.00	6905.72		983225.13
10	5	79	913	6559.00	6905.72		983225.13
10	5	79	1005	6557.86	6904.52		983223.94
10	5	79	1320	6554.01	6900.47		983219.87
10	5	79	2341	6555.50	6902.04		983221.44
11	5	79	1152	6556.50	6903.09		983222.50
12	5	79	1555	6559.50	6906.25		983225.69
12	5	79	2230	6560.56	6907.37		983226.75

### Ice Floe Rotation and Magnetic Declination

The satellite navigation sets used at FRAM I did not determine azimuth. Since ice floes tend to rotate, it was desirable to determine the change in azimuth with time of a reference line on the floe. A line from the Lamont profiling current meter hut to the meteorological tower was chosen as an arbitrary base line. A break in the FRAM I floe on March 28th made it necessary to move the meteorological tower. So at that time there was a change in the base line used for reference.

Azimuth was determined by solar fixes on a daily basis using a Wild T-2 theodolite. On occasion cloud cover obscured the sun and no fix could be taken.

The ice floe showed a net clockwise rotation of  $56^{\circ}$  between April 2nd and May 11th. The azimuth values are considered reliable to within  $\pm 0.2^{\circ}$ .

A magnetic compass with a 4-inch needle, sighting vanes and mounted on a tripod was read when sun sights were made. Declination was found by comparing the magnetic bearing with the azimuth of the reference line. The value of declination decreased steadily during FRAM I's drift, ranging from  $33^{\circ}\text{W}$  to  $20^{\circ}\text{W}$ . Declination is estimated to be reliable within  $\pm 0.5^{\circ}$ .

Ice Floe Azimuth and Magnetic Declination

Key to column headings:

DY = Day

MN = Month

YR = Year

GMT = Greenwich mean time

AZ = Azimuth of camp reference line

MGDC = Magnetic declination in degrees of  
bearing west from true north



## FRAM 1 AZIMUTH AND MAGNETIC DECLINATION

DT	MM	YR	GMT	AZ	MGDC
26	03	79	1503	149.7	32.3
27	03	79	1427	153.1	28.9

## CAMP BREAKUP

02	04	79	1034	191.9	33.0
03	04	79	1250	190.8	28.7
04	04	79	1611	192.4	28.6
05	04	79	1125	193.3	28.0
06	04	79	1329	194.2	28.0
07	04	79	1332	193.5	26.5
08	04	79	1256	194.0	27.2
09	04	79	1819	194.0	
10	04	79	1304	198.1	24.7
11	04	79	1609	194.8	28.6
12	04	79	1413	196.4	28.1
13	04	79	1300	202.6	26.7
14	04	79	1259	207.1	26.4
15	04	79	1240	207.2	26.0
16	04	79	1243	208.4	25.1
17	04	79	1241	209.2	25.0
18	04	79	1526	212.4	25.0
19	04	79	1314	214.3	25.7
20	04	79	1412	218.7	27.0
21	04	79	1321	224.0	26.0
22	04	79	1251	226.7	24.3
23	04	79	1246	227.7	24.5
24	04	79	1444	228.2	25.0
25	04	79	1316	228.8	24.2
26	04	79	1248	229.4	23.8
27	04	79	1243	229.3	25.2
28	04	79	1236	228.5	24.5
29	04	79	1404	229.8	24.2
30	04	79	1240	230.1	23.7
01	05	79	1300	231.5	26.3
02	05	79	1259	232.6	24.4
03	05	79	1357	233.4	26.3
04	05	79	1333	234.0	25.0
05	05	79	1319	236.3	24.0
06	05	79	1244	238.4	24.0
07	05	79	1251	239.9	24.1
08	05	79	1252	246.9	24.0
09	05	79	1313	245.1	24.0
10	05	79	1335	247.0	23.0
11	05	79	1412	247.8	20.0

## REFERENCES:

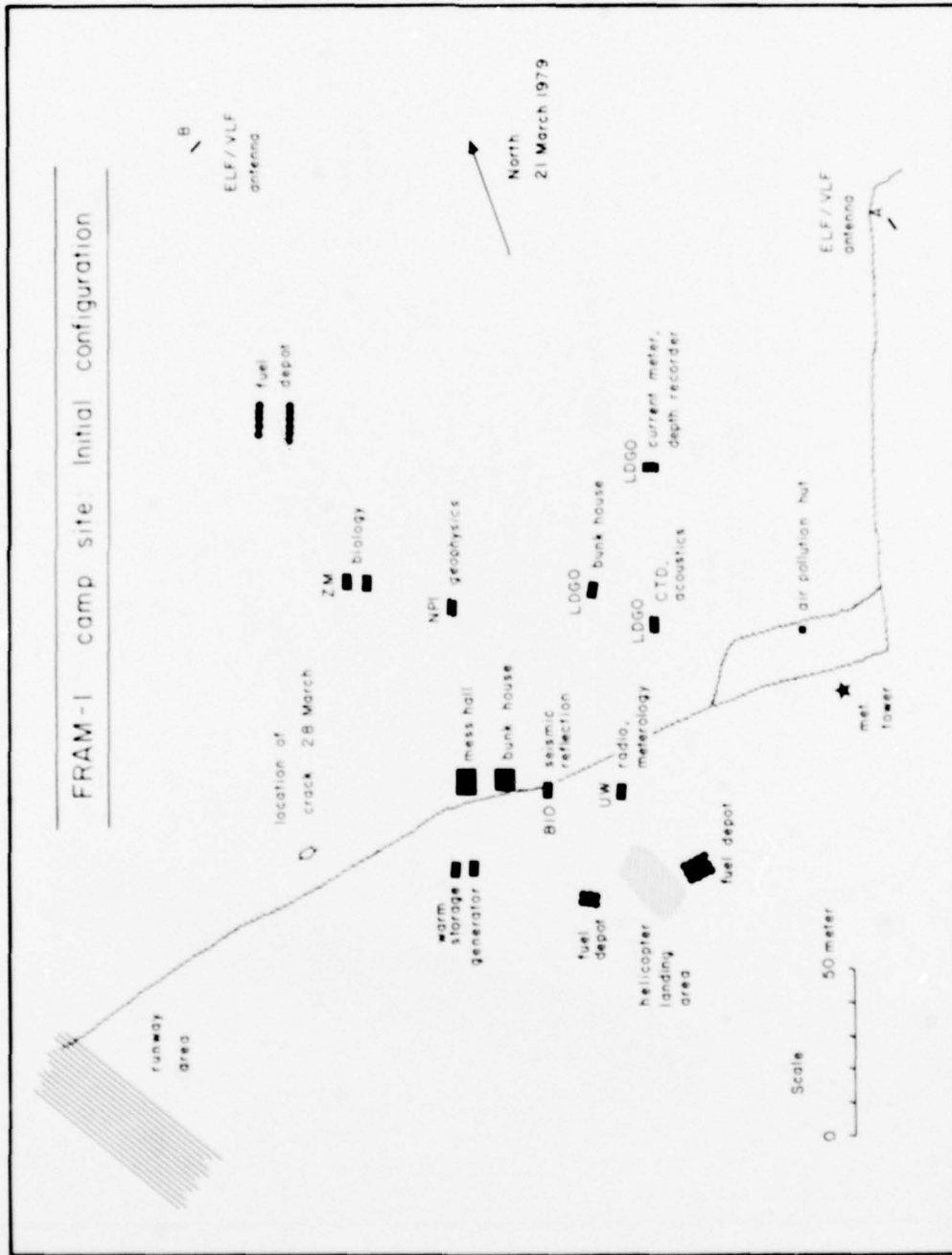
Hunkins, K., Waves on the Arctic Ocean, J. Geophys. Res., 67, 2477-2489, 1962.

Matthews, D. J., Tables of the velocity of sound in pure water and sea water for use in echo-sounding and sound-ranging, Hydrographic Dept., Admiralty, London, 1939.

## A P P E N D I X

THE FOLLOWING MAPS OF THE FRAM I CAMP, DRIFT TRACK  
AND NORWEGIAN SCIENTIFIC PROGRAMS WERE KINDLY PROVIDED  
BY DR. YNGVE KRISTOFFERSEN OF THE NORSK POLARINSTITUTT.

# FRAM-I camp site Initial configuration

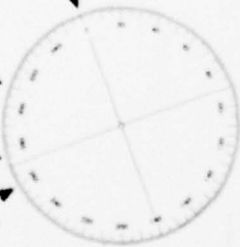




# FRAM-I main camp

North direction:

10 May  
12 April  
20 April



21 March

runway  
on  
refrozen  
lead  
in  
use  
after  
20 April

B  
ELF/VLF  
antenna

helicopter  
landing  
area

ZM  
biology,  
geology

5kW  
generator

NPI

geophysics

bunk  
house

mess hall

fuel

riometer  
antenna

A  
ELF/VLF  
antenna

LDGO  
bunk house

LDGO

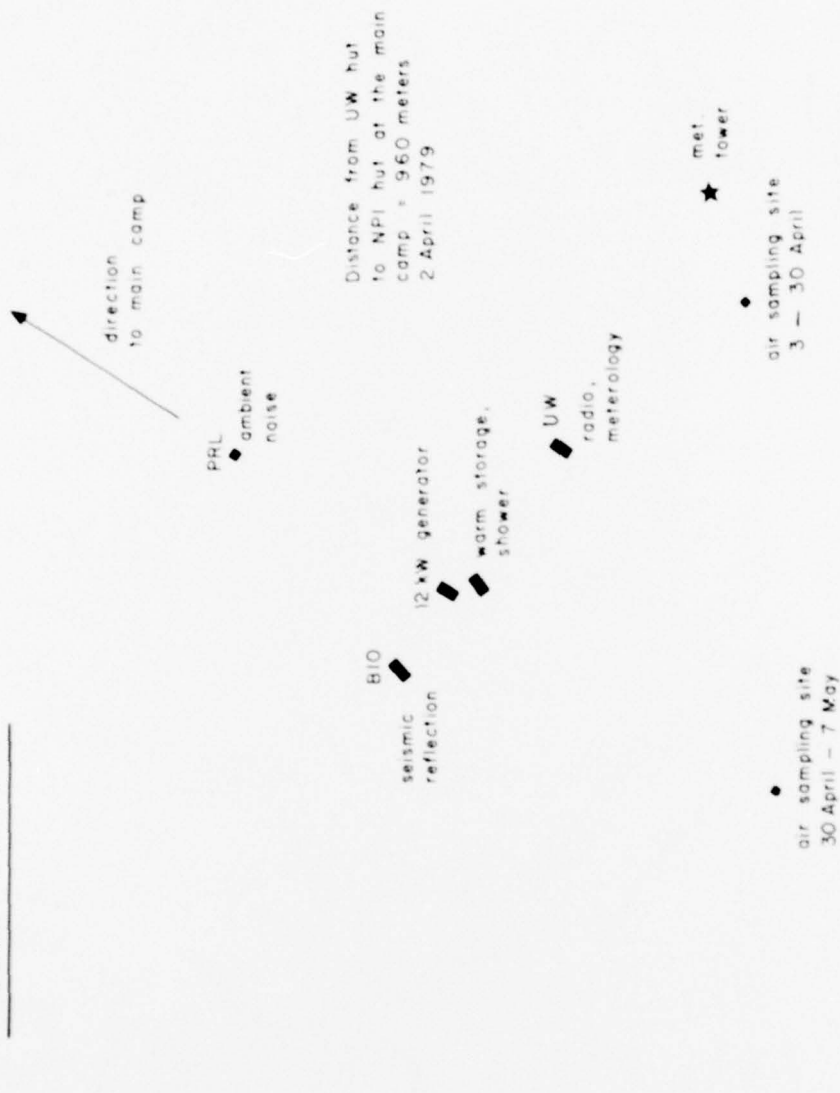
LDGO  
CTD,  
acoustics

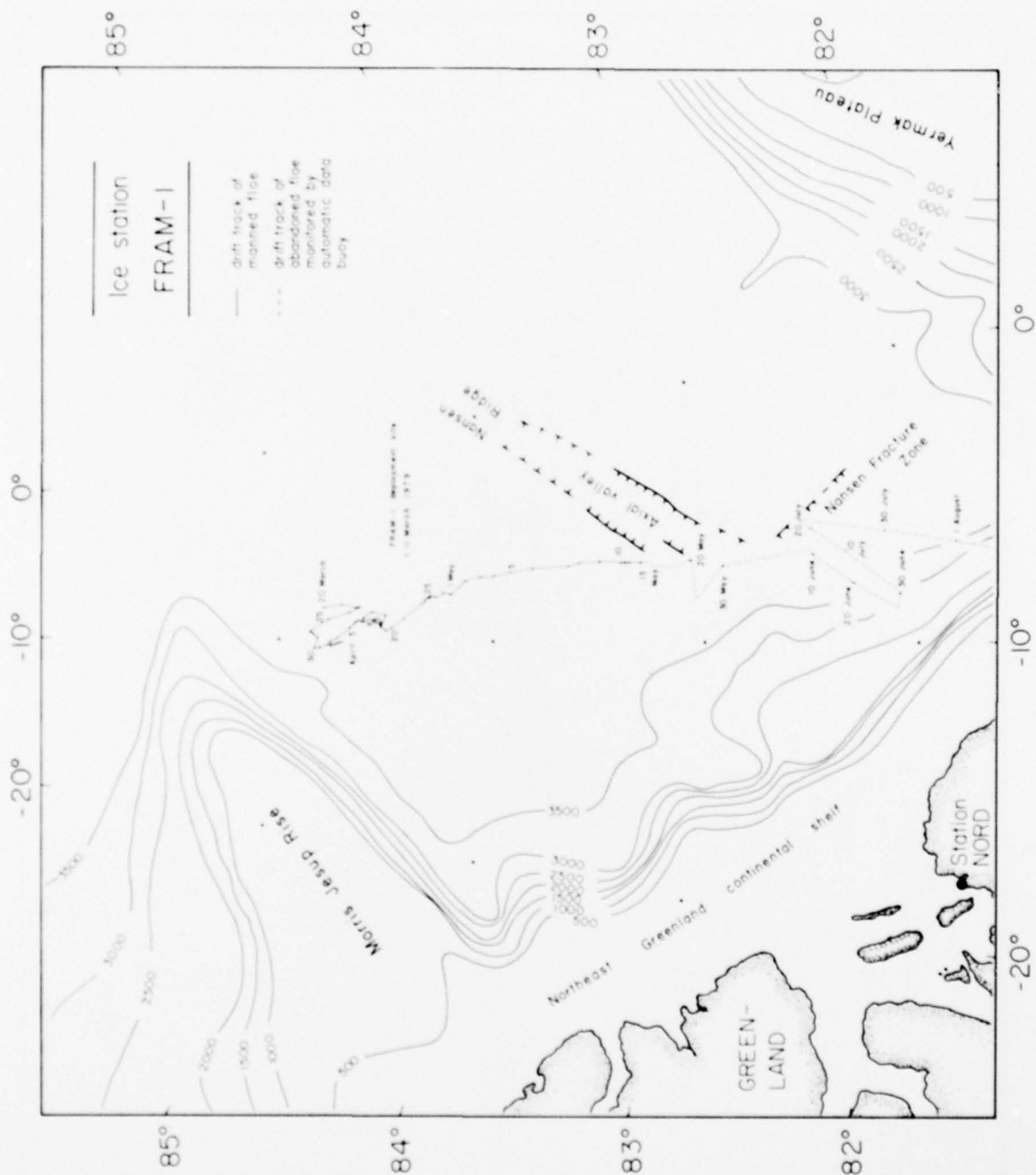
current meter,  
depth recorder

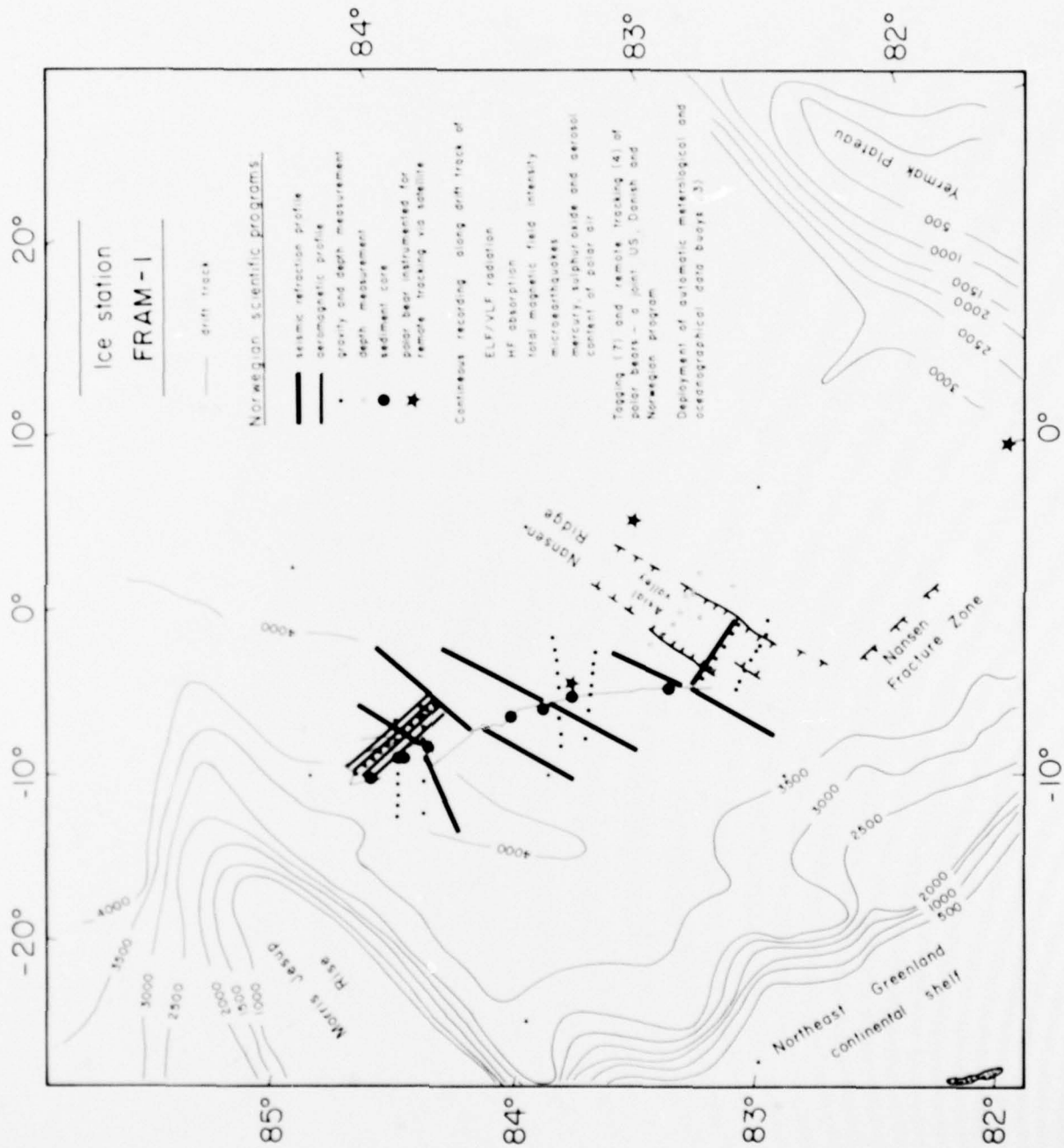
base line  
direction to "South FRAM"

Scale  
0 50 meter

"South FRAM"









MANDATORY DISTRIBUTION LIST

FOR UNCLASSIFIED TECHNICAL REPORTS, REPRINTS, & FINAL REPORTS  
PUBLISHED BY OCEANOGRAPHIC CONTRACTORS  
OF THE OCEAN SCIENCE AND TECHNOLOGY DIVISION  
OF THE OFFICE OF NAVAL RESEARCH

1	Director of Defense Research and Engineering Office of the Secretary of Defense Washington, D. C. 20301 ATTN: Office, Assistant Director (Research)	12**	Defense Documentation Center Cameron Station Alexandria, VA 22314	
	Office of Naval Research Arlington, VA 22217		Commander Naval Oceanographic Office Washington, D. C. 20390	
3	ATTN: (Code 480)*		1	ATTN: Code 1640
1	ATTN: (Code 460)*		1	ATTN: Code 70
1	ATTN: (Code 102-OS)			
6	ATTN: (Code 1021P)			
1	ONR Res. Rep.	1	NODC/NOAA Rockville, MD 20882	
	Director Naval Research Laboratory Washington, D. C. 20375	1	Asst. Chief for Technology Office of Naval Research Code 200 Arlington, VA 22217	
6	ATTN: Library, Code 2620			

TOTAL REQUIRED - 35 copies

\* Add one separate copy of  
Form DD-1473

\*\* Send with these 12 copies  
two completed forms DDC-50,  
one self-addressed back to  
contractor, the other ad-  
dressed to ONR, Code 480

ADDITIONAL DISTRIBUTION LIST:

Dr. Knut Aagaard  
Dept of Oceanography  
University of Washington  
Seattle, Wash. 98195

Major Paul Ancker  
Forsvarskominandoen  
Postbox 202  
2950 Vedbaek  
Denmark

Mr. Beaumont M. Buck, Pres.  
Polar Research Laboratory, Inc.  
123 Santa Barbara St.  
Santa Barbara, Calif. 93101

Dr. Robin K. H. Falconer  
Atlantic Geoscience Centre  
Geological Survey of Canada  
Bedford Institute of Oceanography  
Box 1006 Dartmouth, N. S. B2Y 4A2  
Canada

Dr. Tore Gjelsvik, Director  
Norsk Polarinstitutt  
Rolfstangveien 12  
P. O. Box 158  
1330 OSLO LUFTHAVN,  
Norway

Major Gunmar Jensen  
Forevarskominandoen  
Postbox 202  
2950 Vedbaek  
Denmark

Dr. Jean Just  
Zoologisk Museum  
Univesitetsparken 15  
2100 KOBENHAVN O  
Denmark

Dr. Yngve Kristoffersen  
Norsk Polarinstitutt  
Postboks 158  
N-1330 OSLO LUFTHAVN,  
Norway

Dr. Miles McPhee  
U. S. Army Cold Regions Research  
and Engineering Laboratory  
P. O. Box 282  
Hanover, N. H. 03755

Dr. H. Gote Ostlund  
University of Miami  
Rosenstiel School of Marine  
and Atmospheric Science  
4600 Rickenbacker Causeway  
Miami, Florida 33149

Polar Science Center  
4059 Roosevelt Way, NE  
Seattle, Wash. 98105

Scott Polar Research Institute  
Cambridge CB 2 1 ER  
England

The Commission for Scientific  
Research in Greenland  
Oster Voldgade 10, tr G, st.,  
Denmark

Dr. Norbert Untersteiner  
Scientific Advisor for  
Arctic and Polar Affairs  
Office of Naval Research  
Code 400 P  
800 North Quincy St.  
Arlington, VA 22218

Dr. Christian Vibe  
Zoologisk Museum  
Universitetsparken 15  
2100 KOBENHAVN O.  
Denmark

Dr. J. R. Weber  
Earth Physics Branch  
Dept. of Energy, Mines and  
Resources  
1 Observatory Crescent  
Ottawa, Ont. K1A 0Y3  
Canada

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Technical Report No. CU-1-79	2. GOVT ACCESSION NO. (7)	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) OBSERVATIONS OF POSITION, OCEAN DEPTH, ICE ROTATION, MAGNETIC DECLINATION AND GRAVITY TAKEN AT THE FRAM I DRIFTING ICE STATION.		5. TYPE OF REPORT & PERIOD COVERED Technical Report, March 1979-May 1979
6. PERFORMING ORG. REPORT NUMBER CU-1-79		7. CONTRACT OR GRANT NUMBER(s) N00014-76-C-0004
8. AUTHOR(s) Kenneth Hunkins, Thomas Manley and Werner Tiemann		9. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR307-359
10. PERFORMING ORGANIZATION NAME AND ADDRESS Lamont-Doherty Observatory of Columbia University Palisades, N. Y.		11. REPORT DATE September, 1979
12. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Arctic Programs, Code 461 Arlington, VA. 22217		13. NUMBER OF PAGES 53
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) (12) (70)		15. SECURITY CLASS. (of this report) Unclassified
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release; distribution unlimited		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)  (14) LDCR-CU-1-79, TR-1		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Arctic Ocean, Geophysics, Ice floes, Drifting stations, Navi- gation, bathymetry, magnetics, gravity		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report contains geophysical data collected by the Lamont group at the FRAM I drifting station. These data in- clude station positions determined by satellite navigation, echo soundings, ice floe azimuths, magnetic declination and gravity readings.  404 477 JLM		

DD FORM 1473

1 JAN 73

EDITION OF 1 NOV 65 IS OBSOLETE  
S/N 0102-LF-014-6601

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)